AMERICAN AUGUST, 1953

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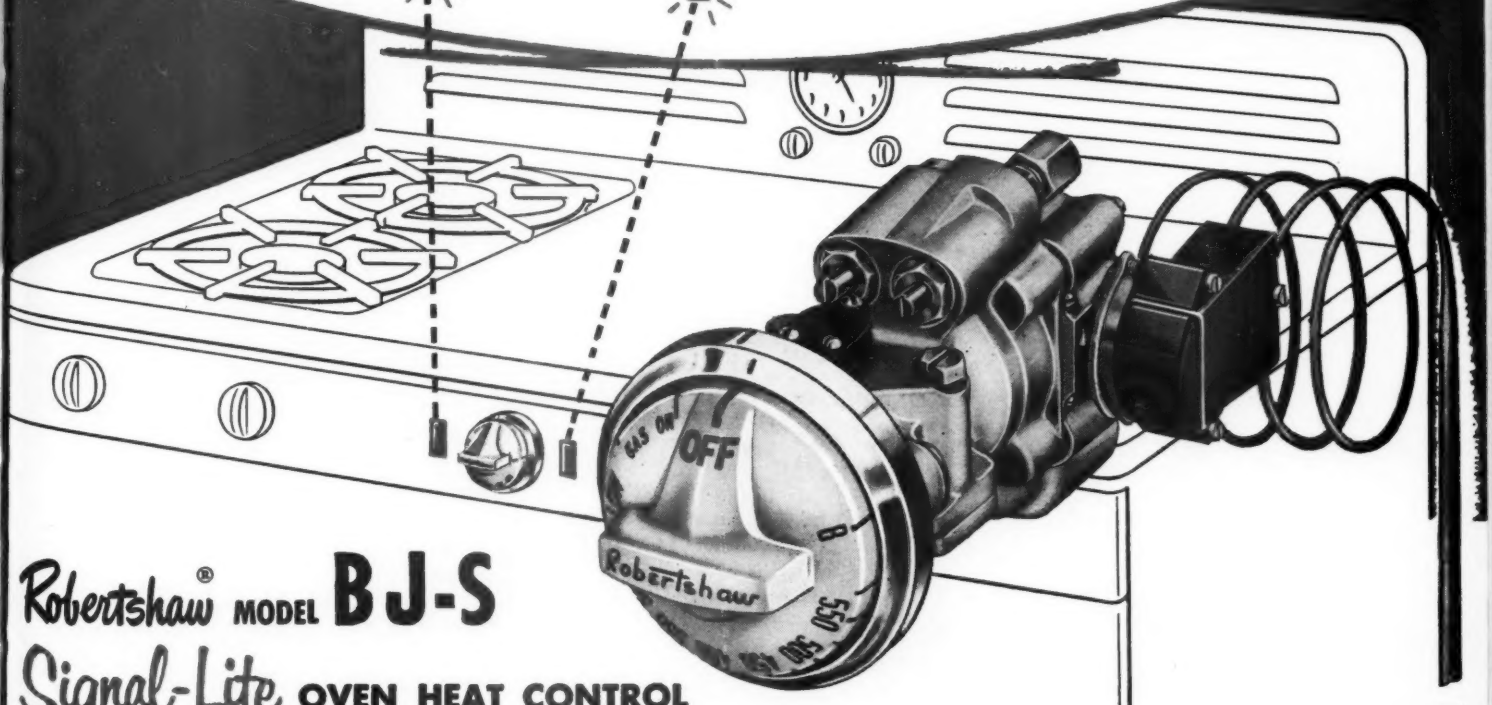

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AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 179 AUGUST 1953 NUMBER 2

This month...

Life in an editorial office is never dull, what with the variegated surprises that fill the days from press-time to press-time. Neither all-black nor all-white, these surprises, one that has been a gleaming spot is the reaction to our "Glossary of Gas Industry Terms" in *American Gas Fundamentals*. Hopefully intended to fill what we regarded as a long-standing and definite need, the Glossary seems to have created a surprising and, indeed, gratifying degree of impatience—to get the full treatment, "aardvark-to-zyzzle" right away, in advance of actual publication.

The broadened terminology of the gas industry and the significant interrelationships with other industries affect the compilation of a glossary that will be a contribution to all segments of the gas industry. There are many sources to be consulted and more appear before us regularly. So, the research, review and refinement of the terms is a process that continues even after type has been set—all in the interest of the best possible editorial product. With no thought to sidetrack other, technical, subjects in the *Fundamentals* outline, future installments of the Glossary will be published frequently—the third is on page 23.

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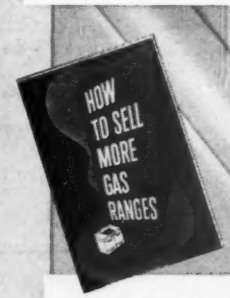

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Editorial:

Watch Out for the Mouse

IN May of this year, we were advised "off the record" that the Gas Industry Development Program, the new pillar of fire by night and a cloud by day, to lead the appliance industry out of the wilderness of merchandising frustration, was about ready to get off the ground.

Now, we are informed officially, through an American Gas Association press conference, that a minor miracle of levitation has been accomplished, and in 10 cities the program, or a reasonable facsimile thereof, will be tried out to see how the famous 15 points of inter-industry cooperation between manufacturers and utilities are going to work out in actual practice.

The guinea pig areas selected are ones in which, in the opinion of local management, merchandising results have not been satisfactory in the past. Any start at all is better than nothing, and in this vein we applaud the utilities that are taking the forward step. Parenthetically we must observe, however, that if unsatisfactory past performance in merchandising is the password to participation in the program, 1,000 cities rather than 10 could well be included in its purview.

Whether or not this first faltering step is to be the forerunner of giant strides in gas appliance merchandising and gas company improvement in its basic load factor, remains to be seen. It is apparent at the outset that this is not a fully coordinated step-by-step program such as was envisioned by its proponents when it was under discussion; and it is far from being what we have had in mind as we have discussed the necessity for such a program over the past two years.

On such crucial questions as market analysis, promotions by type of appliances, and dealer relations, for instance, there is a glaring absence of specific and concrete recommendations. The AGA answer to inquiries concerning these fundamental components of any overall plan is that the details have to be adapted to local conditions. "Local conditions" has become, over the years, an escape hatch through which the association's planners have crawled with happy relief every time a controversial question on national planning or policy has been raised.

We readily grant that local conditions do have to be taken into consideration in the promulgation of any industry program. But the fact that every community in the Nation is not absolutely uniform and standard with every other community, is no excuse for failure to come up with a specific plan and specific recommendations when industry development is at stake.

In a test program, such as the current excursion is presumed to be, local conditions might well dictate what specific recommendations are to be followed and what are to be rejected, with the reasons for their rejection plainly understood and stated. Only then can the experiences noted in one locality be translated into terms applicable to similar areas or similar communities served by the gas utilities.

In our opinion, which we have already stated editorially, the first step in the development of any market, local or national, should be a survey undertaken to find out the predictable potential of that market, and the degree to which that market has been exploited in the past.

Here, the AGA approach is one of characteristic vagueness. Depending on "local conditions," this preliminary market study may be anything from completely professional research undertaken by experts, to a public opinion survey palmed off on the meter readers. Perhaps some categorical correlation of these heterogeneous findings can be accomplished, but we cannot visualize their translation into market terms.

Were it not almost tragic in its portent, we could laugh at the suggestion—seriously advanced—that the trade press of the gas industry refrain from listing the names of the cities in which the dry run is to be made. This on the grounds that the participating utilities might be deluged with an influx of manufacturers representatives, salesmen, peddlers and other assorted eager beavers each intent on having his own line of merchandise given preference in the forthcoming promotions.

If the sales manager of a gas utility is too busy to consider any proposal for cooperation on the part of a manufacturer—cooperation that should result in building or maintaining his gas load—we ask with all due respect for his lofty eminence: Just what the hell is he doing that can be of greater importance?

The Gas Industry Development Program got off to a brave start, in its original conception. Brave because both appliance manufacturers and gas companies faced up like men to their own shortcomings, and to the *un*enviable decline in competitive position and prestige that has resulted.

The statement of basic policies and the recommendations to which both have subscribed still remains a challenging thesis on which industry development can be built through mutual cooperation. Needed now, is only its implementation. We assume that AGA is regarded by the participating utilities as the agency through which their intentions are to be translated into terms of specific and objective action.

In candor and fairness, and with a deep sense of moral obligation to the industry that we serve, we must appraise the first steps as they have been revealed to us, as completely inadequate in relation to the urgency and the magnitude of the job to be done.

If this is an indication of the concept and vision that is to guide the Gas Industry Development Program, then indeed "the mountain has labored and brought forth a mouse."

Elliott Taylor

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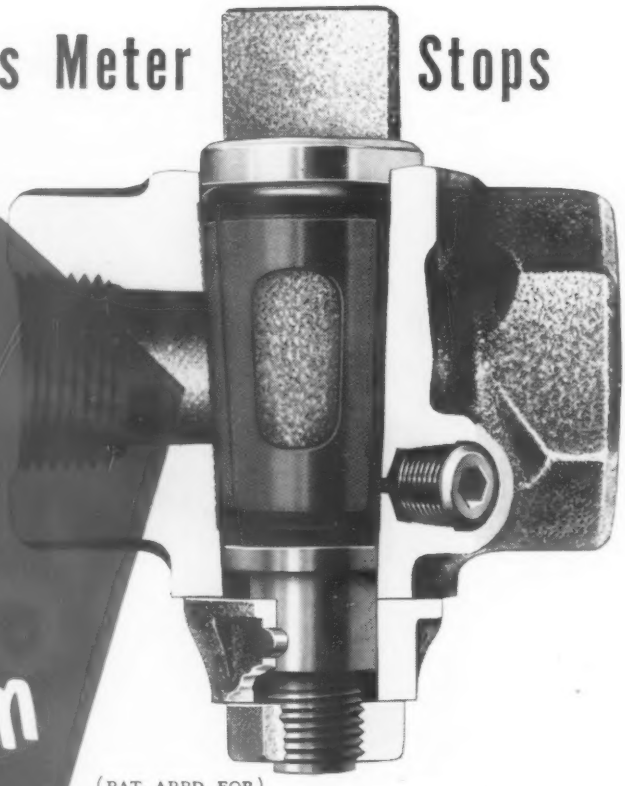

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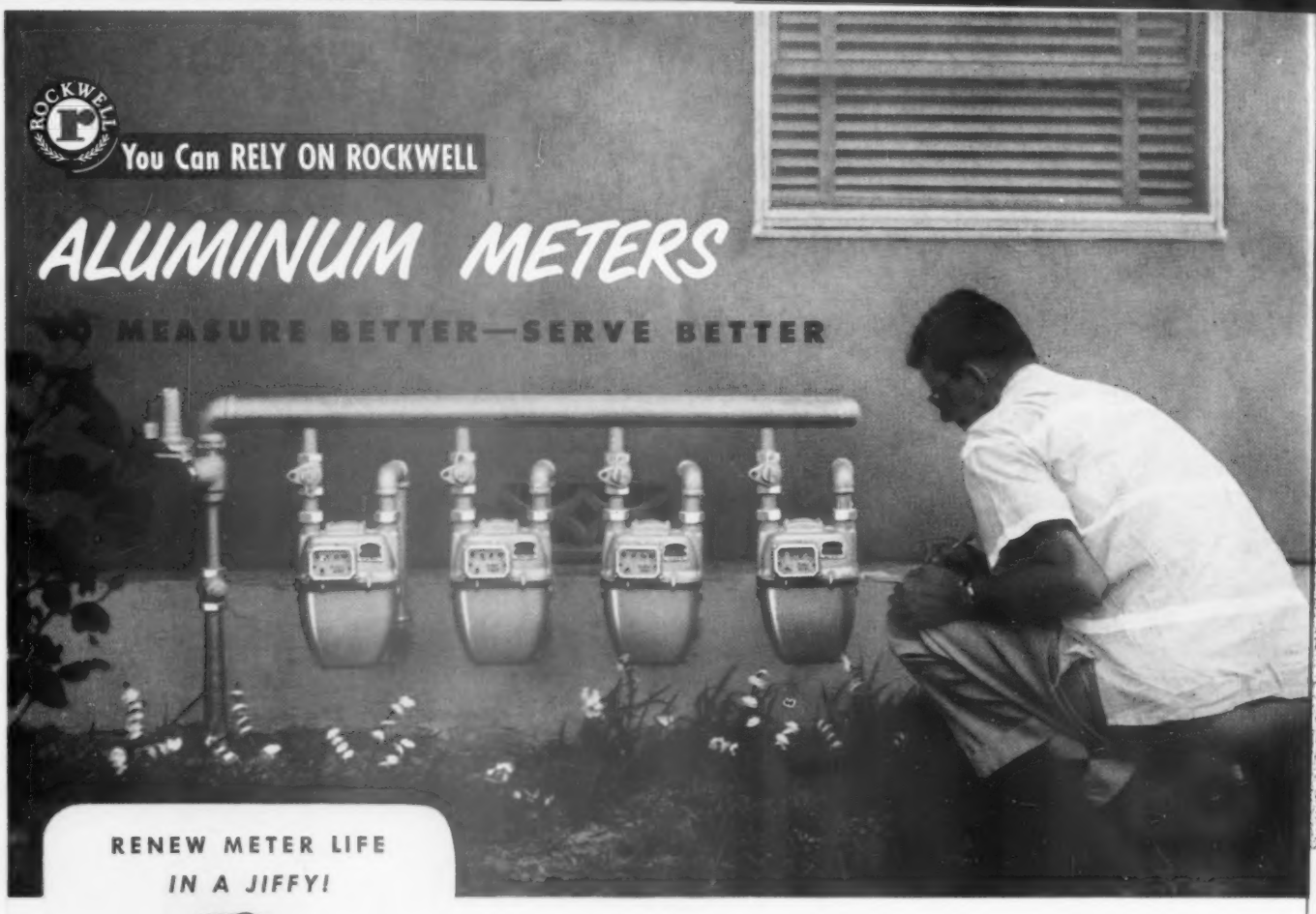

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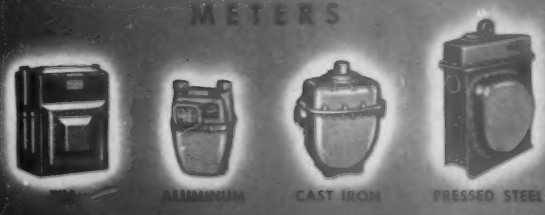

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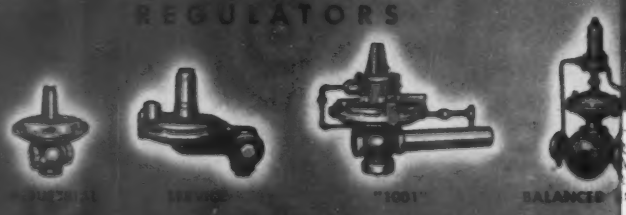

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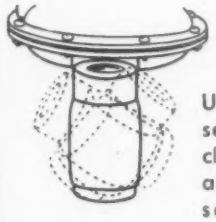

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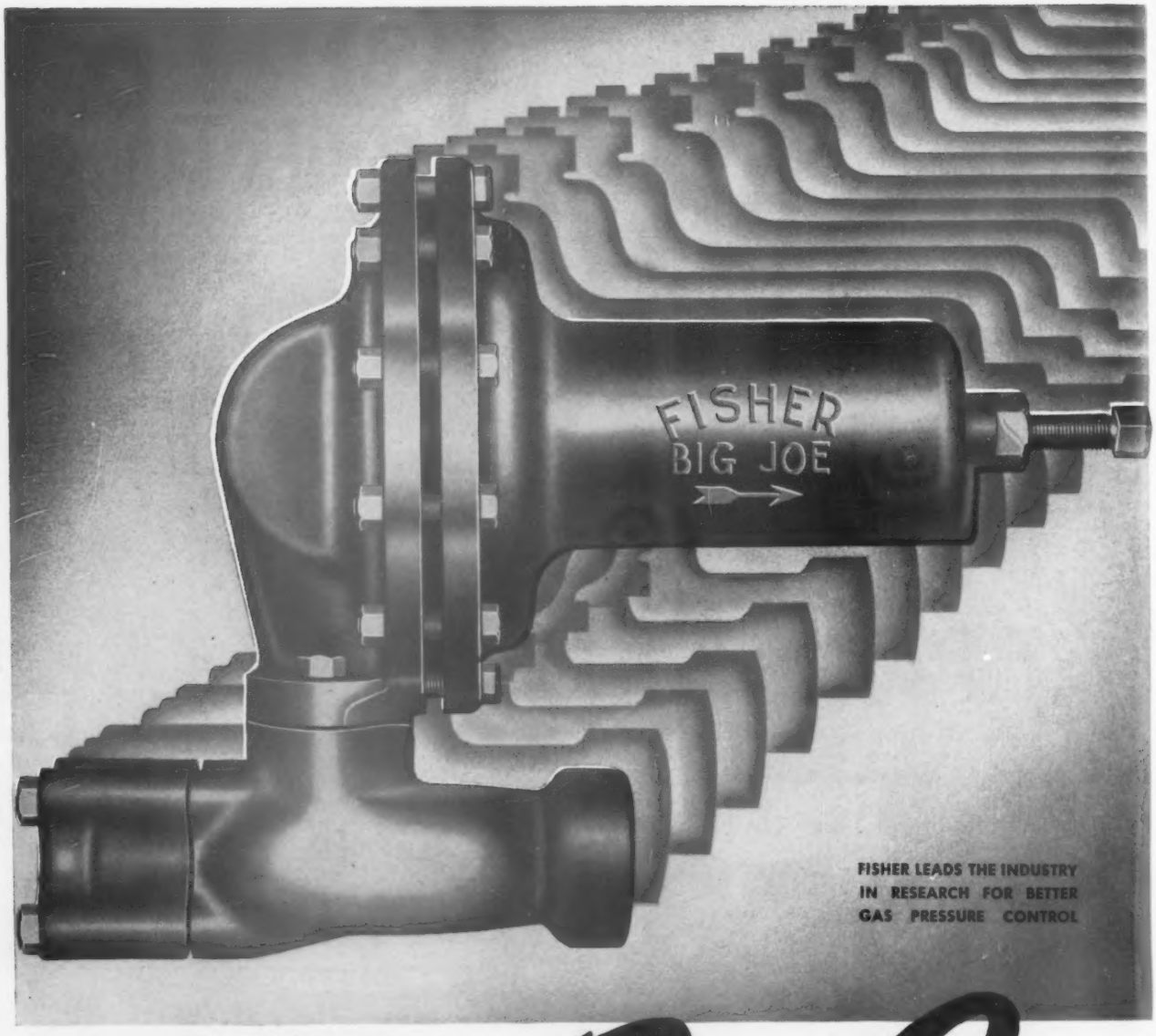

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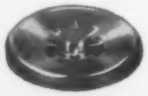

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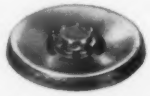

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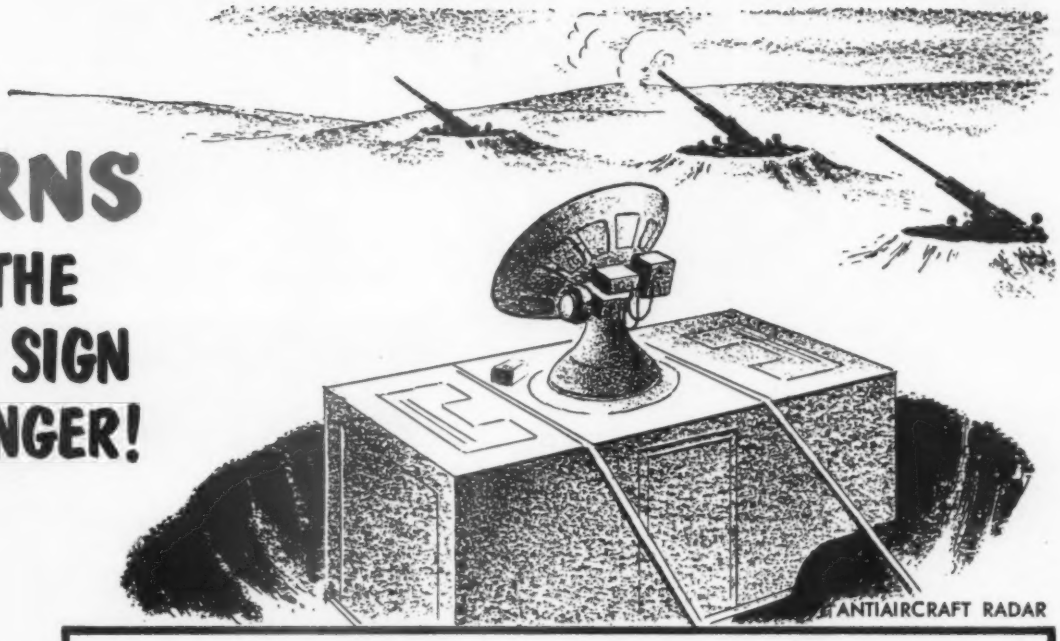

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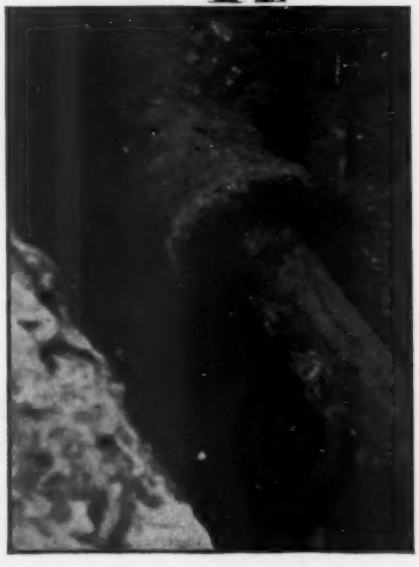

This cast iron gas main is in good condition after over 100 years of service in Providence, R. I.—one of more than 45 cities with century-old gas or water mains in service.

Modernized **cast iron**

CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

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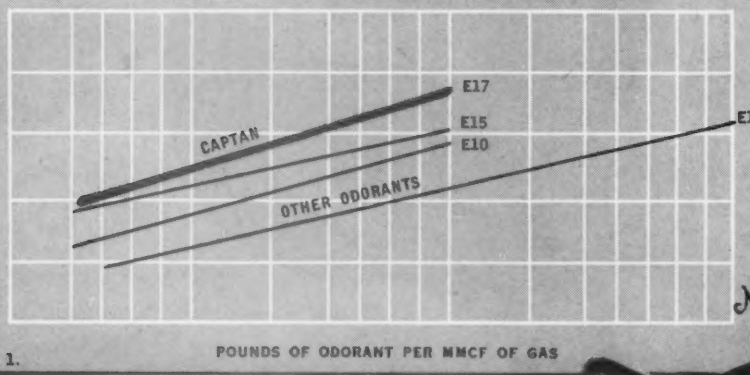


FIG. 1.

for a better GAS ODORANT

to solve your special problem . . .

- anytime
- anyplace
- anywhere

ALWAYS CAPTAN ON TOP

As the leaders in every field strive to maintain supremacy on land, sea and air . . so does Natural Gas ODORIZING Co., Inc., continue to regularly test CAPTAN in independent laboratories against all gas ODORANTS. Results of these tests definitely prove CAPTAN best.

Our objective is not only to continue to make the finest gas odorant but to offer the finest, fastest and most dependable service. The company's expert, well trained engineers are ready at a moment's notice to help you solve any odorization problem, large or small, nation-wide. This is made possible by the fact that ODORIZATION is the company's one and only business.

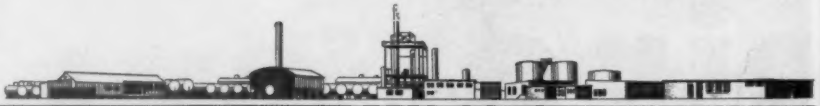
Prompt Service from our . . .

- EXPERT SPECIALLY TRAINED ENGINEERS
- COMPETENT OFFICE FORCE
- STRATEGICALLY LOCATED WAREHOUSES
- RELIABLE SHIPPING SERVICE

DON'T DELAY . . .

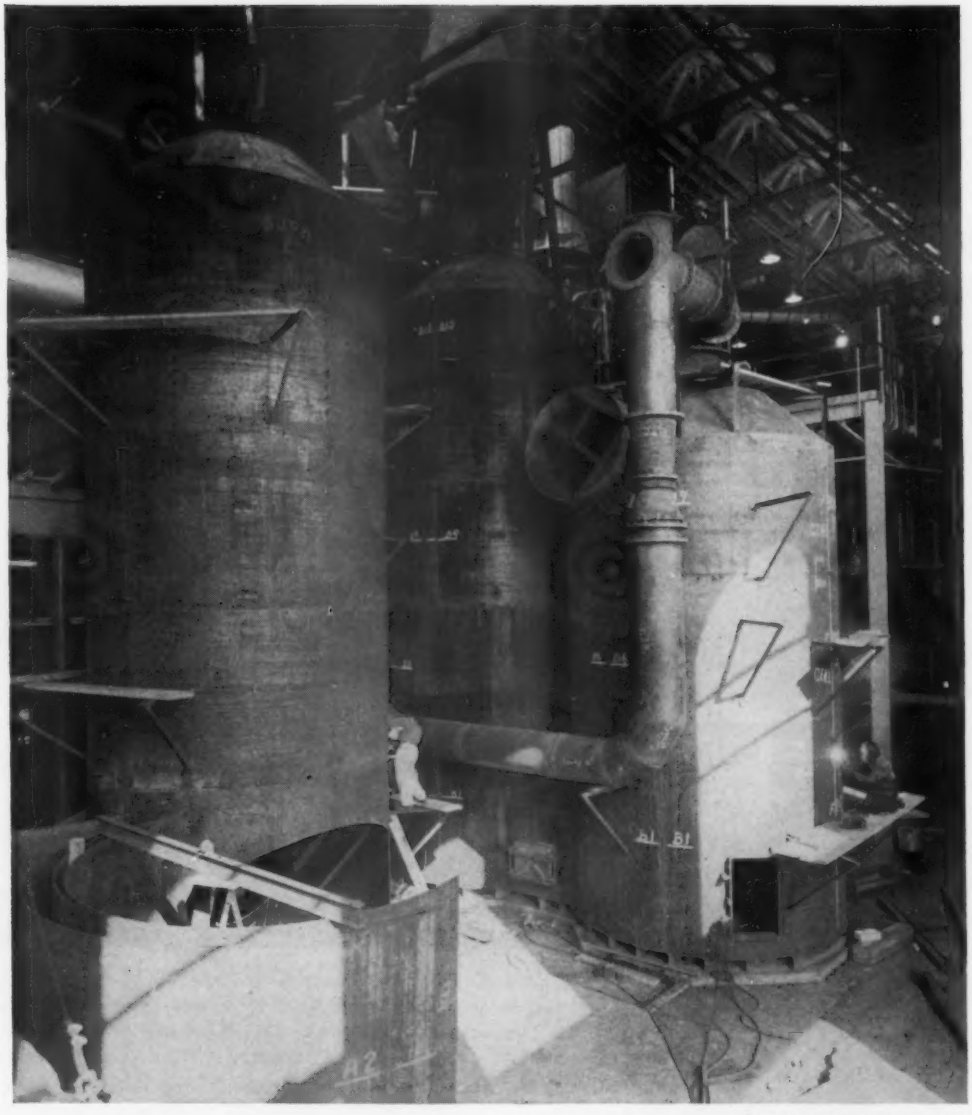
phone, wire or write us today.

captan



NATURAL GAS ODORIZING CO., INC.

P. O. BOX 1645 HOUSTON, TEXAS



13' Oil Gas Set under Construction

"Philadelphia" INSTALLS NEW OIL GAS SET

A 13' diameter U.G.I. oil gas set for use of heavy oil is now under construction at the Station "A" Plant of the Philadelphia Gas Works Division of the United Gas Improvement Company. This is a 4-shell regenerative set and will use the Hall Process of the American Gas Association. The gas produced is to be a part of the plant's mixed gas sendout of purchased coke-oven gas, carburetted water gas, cyclic catalytic reformed gas, modified natural gas, modified L.P. gas, and natural gas and L.P. gas for enriching.

United offers facilities for the design, construction and operation of oil gas handling and treating apparatus in addition to the production apparatus. Each oil gas installation made reflects United's extensive experience in the development of oil gas and closely related processes and equipment.

UGI Equipment

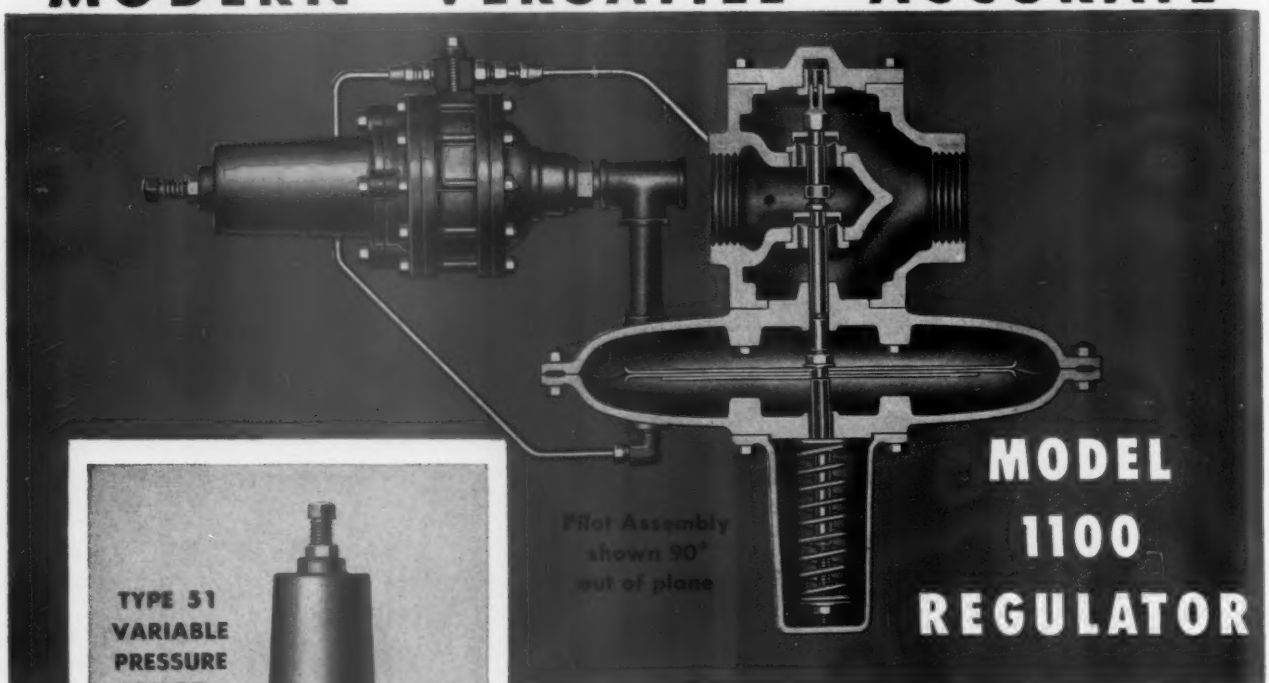
UNITED ENGINEERS & CONSTRUCTORS INC

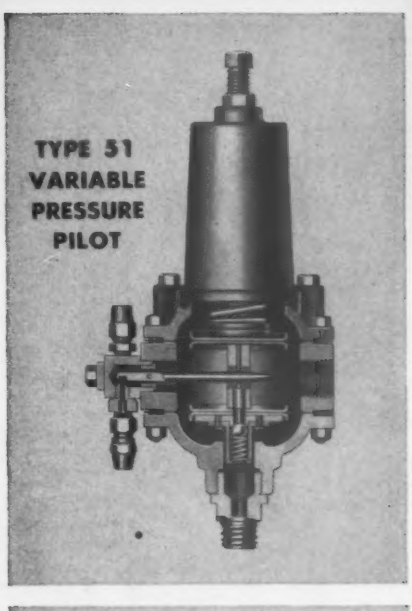
NEW YORK 17 PHILADELPHIA 5 CHICAGO 2

WITH A BACKGROUND OF OVER SEVENTY YEARS' EXPERIENCE

Chaplin-Fulton

MODERN—VERSATILE—ACCURATE





• the heart of the MODEL 1100 assembly, insuring precisely accurate control over the complete flow range. • Unitized construction—valve lever and orifice as a unit are removed from the outside, without disturbing balance of assembly. The likely trouble spot—the orifice—is placed outside where you can get at it quickly—no internal tubes to clog. • Twin diaphragms remove as a unit. • Internal relief unit—guards against overpressure. • Spring unit—remove three screws to change springs. • Built for service. • Used for accuracy.

You can't buy, beg, borrow or steal a more versatile pressure regulator than MODEL 1100. Nor has traditional Chaplin-Fulton ruggedness, simplicity or accuracy been forgotten in this new modern design. Size—2" only.

Wider Application —Inlet Max.—250 psi. Outlet Range—1" to 75 psi or 50 to 150 psi.

Greater Capacity —24,000 CFH at 10 psi to ounces; 114,000 at 100 psi. Body contoured for flow.

Easier Maintenance—regulator or pilot can be serviced without disturbing the other. Quickly accessible orifices in both, easily renewable.

Simpler Installation—only one connection required. No complicated pins or toggles to adjust.

You can standardize on MODEL 1100 for a wider range of your industrial, commercial or distribution installations.

ACCURATE CF MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

Editorial:

Watch Out for the Mouse

IN May of this year, we were advised "off the record" that the Gas Industry Development Program, the new pillar of fire by night and a cloud by day, to lead the appliance industry out of the wilderness of merchandising frustration, was about ready to get off the ground.

Now, we are informed officially, through an American Gas Association press conference, that a minor miracle of levitation has been accomplished, and in 10 cities the program, or a reasonable facsimile thereof, will be tried out to see how the famous 15 points of inter-industry cooperation between manufacturers and utilities are going to work out in actual practice.

The guinea pig areas selected are ones in which, in the opinion of local management, merchandising results have not been satisfactory in the past. Any start at all is better than nothing, and in this vein we applaud the utilities that are taking the forward step. Parenthetically we must observe, however, that if unsatisfactory past performance in merchandising is the password to participation in the program, 1,000 cities rather than 10 could well be included in its purview.

Whether or not this first faltering step is to be the forerunner of giant strides in gas appliance merchandising and gas company improvement in its basic load factor, remains to be seen. It is apparent at the outset that this is not a fully coordinated step-by-step program such as was envisioned by its proponents when it was under discussion; and it is far from being what we have had in mind as we have discussed the necessity for such a program over the past two years.

On such crucial questions as market analysis, promotions by type of appliances, and dealer relations, for instance, there is a glaring absence of specific and concrete recommendations. The AGA answer to inquiries concerning these fundamental components of any overall plan is that the details have to be adapted to local conditions. "Local conditions" has become, over the years, an escape hatch through which the association's planners have crawled with happy relief every time a controversial question on national planning or policy has been raised.

We readily grant that local conditions do have to be taken into consideration in the promulgation of any industry program. But the fact that every community in the Nation is not absolutely uniform and standard with every other community, is no excuse for failure to come up with a specific plan and specific recommendations when industry development is at stake.

In a test program, such as the current excursion is presumed to be, local conditions might well dictate what specific recommendations are to be followed and what are to be rejected, with the reasons for their rejection plainly understood and stated. Only then can the experiences noted in one locality be translated into terms applicable to similar areas or similar communities served by the gas utilities.

In our opinion, which we have already stated editorially, the first step in the development of any market, local or national, should be a survey undertaken to find out the predictable potential of that market, and the degree to which that market has been exploited in the past.

Here, the AGA approach is one of characteristic vagueness. Depending on "local conditions," this preliminary market study may be anything from completely professional research undertaken by experts, to a public opinion survey palmed off on the meter readers. Perhaps some categorical correlation of these heterogeneous findings can be accomplished, but we cannot visualize their translation into market terms.

Were it not almost tragic in its portent, we could laugh at the suggestion—seriously advanced—that the trade press of the gas industry refrain from listing the names of the cities in which the dry run is to be made. This on the grounds that the participating utilities might be deluged with an influx of manufacturers representatives, salesmen, peddlers and other assorted eager beavers each intent on having his own line of merchandise given preference in the forthcoming promotions.

If the sales manager of a gas utility is too busy to consider any proposal for cooperation on the part of a manufacturer—cooperation that should result in building or maintaining his gas load—we ask with all due respect for his lofty eminence: Just what the hell is he doing that can be of greater importance?

The Gas Industry Development Program got off to a brave start, in its original conception. Brave because both appliance manufacturers and gas companies faced up like men to their own shortcomings, and to the *un*enviable decline in competitive position and prestige that has resulted.

The statement of basic policies and the recommendations to which both have subscribed still remains a challenging thesis on which industry development can be built through mutual cooperation. Needed now, is only its implementation. We assume that AGA is regarded by the participating utilities as the agency through which their intentions are to be translated into terms of specific and objective action.

In candor and fairness, and with a deep sense of moral obligation to the industry that we serve, we must appraise the first steps as they have been revealed to us, as completely inadequate in relation to the urgency and the magnitude of the job to be done.

If this is an indication of the concept and vision that is to guide the Gas Industry Development Program, then indeed "the mountain has labored and brought forth a mouse."

Elliott Taylor

Drycleaning Machine Combats Meter Sho

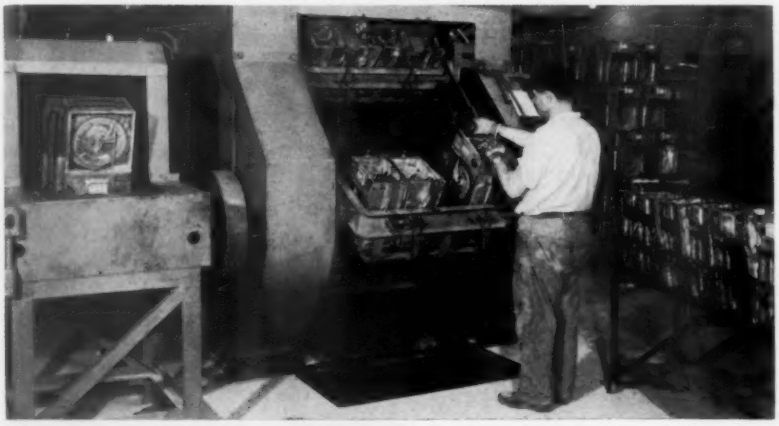
by George E. Griffin
Superintendent, Meter Repair Division
The Brooklyn Union Gas Company

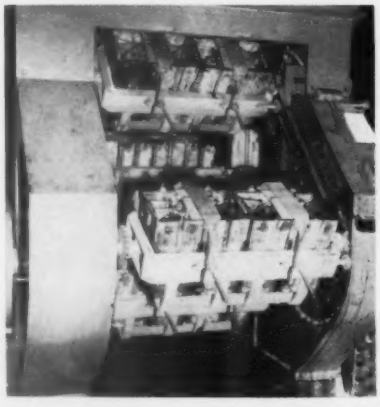
IT has been said that there are as many different types of meter repair shops as there are types of gas or gas distribution systems. This never has been highlighted so forcibly as in the past few years when natural gas was piped from Louisiana and Texas to invade most of the larger cities on the eastern seaboard. The repair shop policies, which on manufactured gas had produced such satisfactory results, no longer were found to be adequate and most meter superintendents woke up suddenly to find that it was a grand new ball game.

It is a tribute to the fine liaison and spirit of cooperation that exists in the American gas industry that the problems experienced by companies in other parts of the country gave some warning, in most instances, as to what conditions would arise in the East. The situation in our company was typical of the problems which arose during the transition to natural gas and of the expedients which were devised to cope with them.

For a number of years we distributed a mixture of carbureted water gas, coke oven gas, and refinery gas augmented on occasion by oil, and LP gases. As the percentages of water gas were high and scrubbing capacity had a constant struggle to keep up with load growth we experienced a liquid phase gum condition in our meters. As long as this condition remained fairly constant, we could tolerate it. We rediaphragmed approximately 33% of the meters brought in for repair but we also were able to make very minor repairs (in which only the top cover was removed) to 45% of our meters. Whereas this might seem a very high percentage of slight repairs for a company with a bad gum condition we were reassured by the fact that 93% of our incoming meters fell within the officially correct limits of ± 2% and the average net error of all meters tested was 0.14% slow (incoming test results for year 1950).

Communications with other companies led us to believe that natural gas would cause our meters to become fast —this proved to be the case. Shortly after limited quantities of natural gas were admitted to our lines in January, 1951, an increase in fast meters was noted. This condition reached its peak in about six months, leveling off at the point where we had approximately 70% officially correct meters and a net error of something under 1% fast. The subsequent conversion to straight natural gas during 1952 caused little if any change in the test results of our incoming meters.





Above, loading and unloading end of degreaser. Aerator in left foreground. Gravity conveyor from opening machines at right.

At the left, a close-up of the unloading and loading station on the degreasing machine.

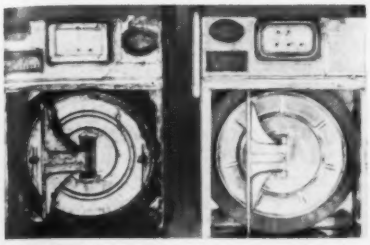
The situation implied by our test results was verified by conditions encountered in the repair shop. Diaphragm replacements increased from their normal 33% to 43%. Furthermore, an investigation of our slight repair program showed that it no longer was wise to process meters in this manner and the slight repair policy was abandoned except where it applied to meters with diaphragms installed after January, 1951. It is readily apparent that when one has to remove the cases from almost 100% of 120,000 meters per year, instead of 55%, and further must install almost 50% more diaphragms, some major changes in shop procedures are in order if production quotas are to be met.

The customer-relations angle

This, however, did not constitute the entire problem. Brooklyn Union always has enjoyed an excellent reputation with its customers. Therefore, as a reassurance both to the customers and the New York Public Service Commission, the company embarked on an accelerated meter change program to be completed in approximately one year. Included in this program were 53,000 5-lt. meters registering in excess of 3,000 cu. ft. of natural gas per month during cold weather and approximately 40,000 larger meters. In changing the latter it was decided to resize the meters in order to take advantage of higher Btu gas. As almost half of the large meters were 10-lts., it was possible to replace them with 210 cu. ft. 5-lt. meters purchased for that purpose.

For several years prior to the advent of natural gas, our company had been engaged in a modernization program at the meter repair shop. Work operations were sectionalized so that mechanics could be trained in the shortest possible time, and various pieces of mechanized equipment were installed. The latter included a washing machine to strip paint and dirt from incoming meters; a monorail to convey meters from the first to

oblem In Conversion to Natural Gas



Typical 5-lt. meters before and after degreasing.

the third floor; gas-fired machines to remove tops, backplates and cases; a skeleton and small parts washing machine; a belt conveyor to carry meters from the proving room to the toppers and gassers; and a conveyorized unit for spray painting meters.

Hence, we were in a good position to handle and open large quantities of meters and also to train mechanics on relatively short notice to meet the necessary production quotas. However, both the working-space requirements and the cost consideration of replacing such large percentages of our diaphragms called for further measures.

Watched Philadelphia story

We had been watching with considerable interest a process for drycleaning meters originated by Robert J. Ott, superintendent, meter division, Philadelphia Gas Works. Meters with the tops, backulates, and cases removed were processed through a conveyorized trichlorethylene bath to remove the oil and gum from the diaphragms and the interior of the meter. In addition to reducing the number of diaphragm replacements, the task of inspecting the diaphragms was simplified. Mr. Ott was most helpful in releasing data concerning his installation and in view of his success it was decided to install similar equipment in our shop.

In planning our installation it was decided to specify a wider machine than was used in Philadelphia so that more than one meter could be placed in a fixture. The latter were designed, therefore, by the manufacturer to hold either two 5-lt. meters or two 10-lt. meters. We had been operating only a few days, however, when we found that by turning 5-lt. meters sideways we could get four of them in a fixture. This permitted us to slow down the cycle and get a better cleaning job. The capacity of the machine as it now is operated is 84 5-lt. meters or 42 10-lt. meters per hour.

Auxiliary to the operation of the degreaser is a solvent still having a capacity of approximately 100 gph. The trichlorethylene is circulated constantly

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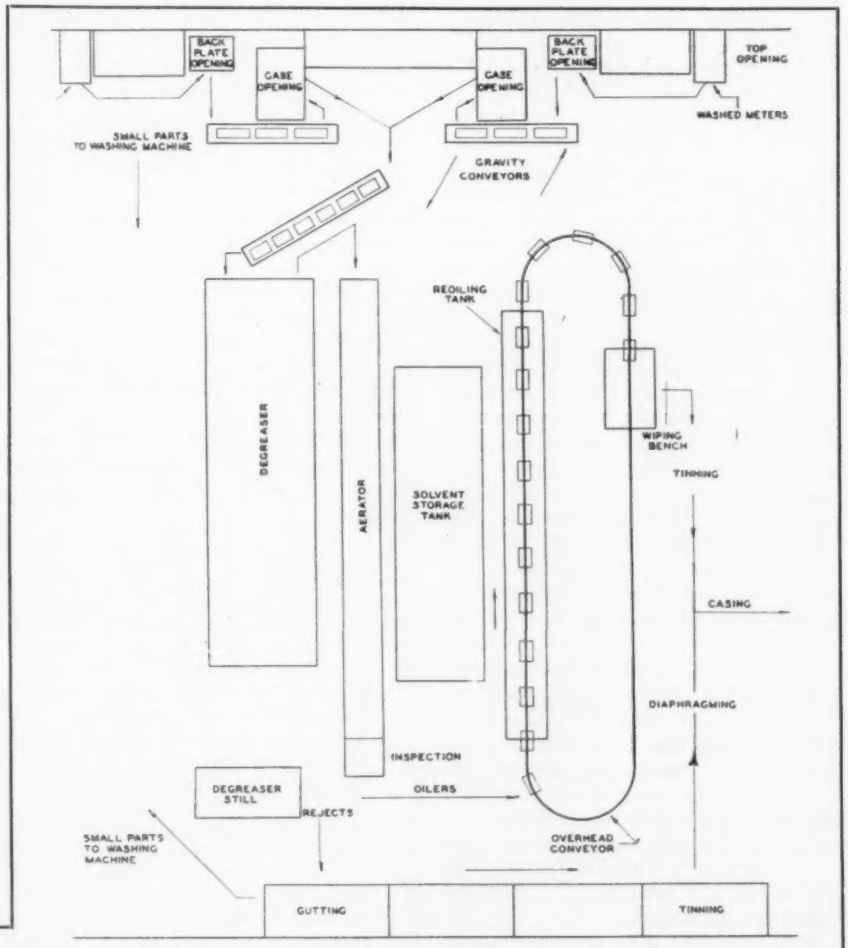
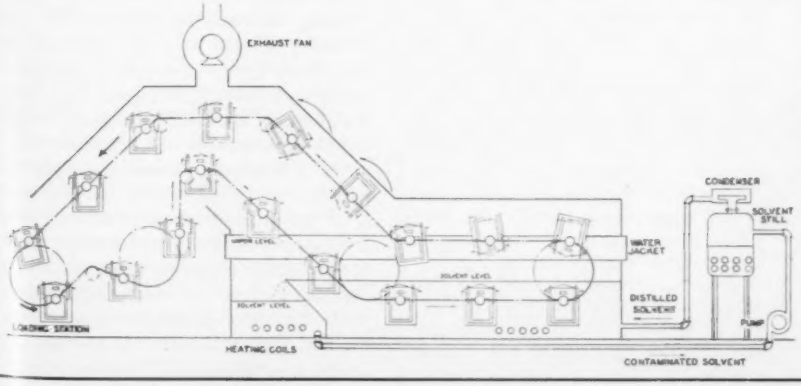




Above, a schematic layout showing how work flows to and through the degreaser. Left, a cross-sectional view showing travel of meters through degreaser.

Gas Companies, GAMA and Public Opinion Kill Kent Coal Grab Bill

THE highly controversial Kent bill, regarded by the gas industry as a thinly disguised attempt to restrict underground storage of natural gas in Pennsylvania, although championed by the coal operators as a mine safety measure, has been defeated for this session of the state legislature largely as the result of a hard hitting public information campaign waged by gas utilities in the Pittsburgh area, assisted by the Gas Appliance Manufacturers Association and its public relations staff.

The bill contained various provisions relative to the plugging of abandoned gas wells, and giving natural gas storage companies the right of eminent domain for storage pools under certain conditions. With these features of the legislative proposal there was no quarrel, but the joker appeared in the form of a section restricting the storage of natural gas within 2,000 feet of a coal mine, in either a vertical or horizontal direction.

Gas company authorities claimed that in practical operation the effects of the Kent bill might be to cut the capacities of storage pools to 50% of their normal storage capacity, thus raising the price of gas to ultimate consumers, rendering the further expansion of house heating extremely dubious and ultimately pinching off gas supplies destined for storage in transit to the Atlantic Seaboard.

Gas industry leaders in the fight were The Equitable Gas Company, and Manufacturers Light and Heat Company, both of Pittsburgh, the Pennsylvania Natural Gas Mens Association and GAMA. Proponents of the bill opposing the gas industry were Western Pennsylvania Coal Operators Association, Central Pennsylvania Coal Producers Association and the Somerset County Coal Operators Association.

When hearings were held on the bill on May 26, before the Pennsylvania House Committee on Mines and Mining, it became apparent to the gas firms that their complacent confidence that it would be defeated was not justified by the political facts. The chairman of the mines committee was Rep. Earl E. Hewitt, a coal broker; and most of the committee's attention and all of its sympathies were extended to those witnesses who spoke in favor of the bill.

A. W. Conover, president of Equitable, J. C. Peterson, president of Manufacturers, L. B. Richards, vice president of The United Gas Improvement Company and head of its Harrisburg Gas Division, and George Doying, executive secretary of the Pennsylvania Natural Gas Mens Association were among those who presented the industry's case in the face of the mines committee's thinly veiled hostility.

Present as observers were H. Leigh Whitelaw, managing director of GAMA, with members of his public relations staff, other officials of the two Pittsburgh gas companies, and Elliott Taylor, editor of AMERICAN GAS JOURNAL.

Following the farcical hearing, it was quickly decided by those present that immediate steps would have to be taken to bring home to the public, and through them to their elected representative the economic evils of the bill, and its certain threat to the future expansion of natural gas for domestic, commercial and industrial uses.

Under the guidance of the GAMA public relations staff, the gas industry outlined a public information program which was immediately put into effect through paid advertising, letters, radio announcements and editorial press releases. The steps taken included the following:

1. A letter over the signature of President Conover was mailed to 220,000 domestic customers of Equitable, exposing the false safety front for the bill and urging recipients to write or wire their representatives. The company had previously sent a warning letter to its industrial customers.
2. Wires were sent to all GAMA members, urging those in Pennsylvania to protest the Kent bill, and those outside the state to have their Pennsylvania sales representatives file their objections. As copies of these protests were received at GAMA headquarters they were made the subject of news releases.
3. Posters were placed on 640 trucks and cars operated by both Manufacturers and Equitable, bearing the legend "Don't let them take it away. Keep the heat on this winter. Write, wire, telephone your representative. Fight the Kent Bill." Other posters were provided for display in show windows of heating and appliance dealers in the Pittsburgh area.
4. A full page newspaper ad was prepared and released in all principal market areas west of Harrisburg.
5. A press conference was held in Pittsburgh, at which Presidents Conover and Peterson outlined to newsmen the possible effect of the bill, stressing the fact that it was an economic and competitive stratagem and not a mine safety measure as alleged.

   The conference was an outstanding success. The gas industry's side of the story was stressed by Pittsburgh newspapers; wire services carried it in detail, and it was the subject of commentary on radio and TV stations for several days.
6. A press kit containing fact sheets, transcripts of principal statements and geological authentication of the safety of underground storage was distributed to reporters at the conference, and later to financial writers, columnists and editorial writers. Many leading editorials in the Pittsburgh newspapers were based mainly on information in the kit.
7. Preprints of an AMERICAN GAS JOURNAL Editorial ("The Pennsylvania Coal Grab" June 1953, p. 13) were mailed with a covering letter to every daily paper editor in Pennsylvania, inviting editorial consideration of the arguments against the bill. Some newspapers, even in the coal regions of the state, reprinted the JOURNAL statement, while others paraphrased its contents in their own editorials.
8. All industries that might be affected by a gas shortage were advised of the gravity of the Kent bill, and many joined gas industry leaders in protest against it.

Pennsylvania legislators are reported to have received more mail on this bill than on any other in the state's history. One representative admitted to over 3,000 letters on the matter within a week. As public clamor mounted the coal strategists in the legislature hastily reported it out of committee, rushed it through the required three readings in the House, and put it to a vote. It was passed by a slim margin of one, although a few weeks previously its proponents had confidently predicted passage by a majority of from 25 to 30 votes.

Observers felt at this point that the waning enthusiasm for the bill in the House presaged its defeat in the Senate, but the tempo of the public information campaign was maintained by GAMA and the embattled Pittsburgh utilities, aided by top officials of UGI who assisted in mapping out a campaign for the eastern half of the state, in which most UGI operating properties are located.

The coal industry had lost the fight by the time the measure reached the State Senate. Instead of being referred to a packed mining committee it was sent by the Lt. Governor to the Senate State

(Continued on page 34)

Acidizing Limestone Formations Increases Production Rates of Natural Gas Wells

WHILE the over-all rate of production of natural gas from any given well must, of necessity, be dependent upon the underground reserve available to it, increases in the production rate can, under specific circumstances, be attained. By acidizing wells in limestone formations—pumping hydrochloric acid solution into the formation—United Fuel Gas Company, Charleston group, Columbia Gas System, is increasing the production rate of 11 of its Big Lime gas wells every year.

Since the company began this acidizing of wells, about 20 years ago, it has realized on an average well, a 218% increase in production rate. Of the 425 Big Lime wells that United Fuel Gas has producing, the production department has acidized about 80.

In the last 12 years, storage wells, too, have been acidized to increase not only the withdrawal of gas but to accelerate the process of initially putting gas in storage. Fifty of the company's 76 storage wells have been acidized to date, and the average well's flow rate has jumped 154%.

The acid that is pumped into the producing lime strata under the earth enlarges only the rate of production; not the underground reserve available to a well. But increases in production rate are exactly what the production and geological departments of United Fuel Gas are looking for. With expanding markets and higher peak-day requirements, the bigger deliverability that acidizing yields has proved to be an important factor.

When a well is acidized

Acidizing gas wells is not new. The simple chemical process calls for the acid to enlarge the porosity of the pay level in the limestone strata so that gas can flow more easily. In simple terms here is what happens when a well is acidized:

An acidizing service company, Dowell, Inc., that works for United Fuel Gas, pumps several thousands of gallons of hydrochloric acid, in solution, into a well which geologists have determined to be susceptible to increased deliverability through acidizing.

The acid eats into the limestone strata holding the gas, and thereby the porus character of the formation is enlarged. The pressurized gas is then able to flow more easily, within the structure and on to the well mouth and transmission lines.

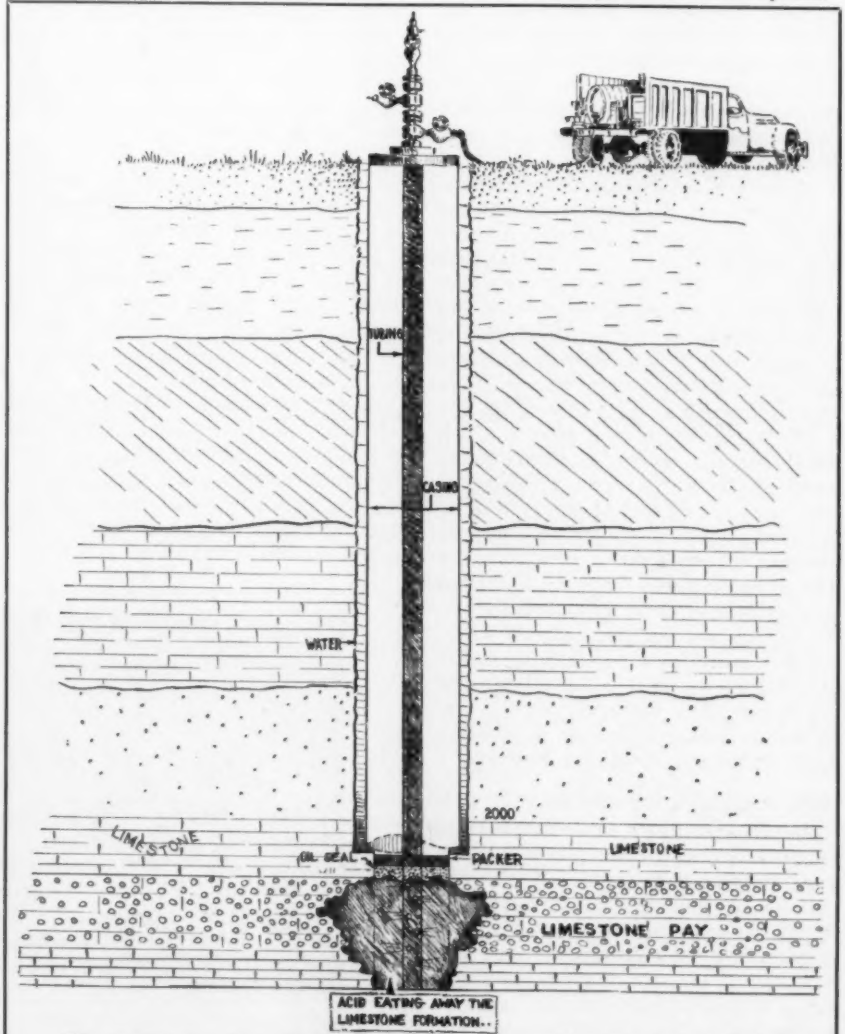
The speed-up in production rate generally lasts as long as it takes to deplete the gas in the formation. The important point here is that while the underground gas reserves remain the same, in volume, the rate of production may have been doubled or quadrupled because of the acidizing action.

Testing for acid reaction

By taking well cuttings from the bailer at the level of the lime formation and running a laboratory test on them, the geologist can be almost certain if the limestone pays will react properly when acid is added. If the test shows that carbon dioxide (CO_2) is produced in adequate quantity, the geologist can be quite sure that the lime can be acidized successfully. When he recommends acidizing, a specialized service company is engaged and plans are made for injecting the solution into the well.

The acidizing of wells is feasible only in wells drilled in limestone formations, calcium carbonate ($CaCo_3$), precipitated

Art and photos, THE PIPELINE, publication of Charleston Group, Columbia Gas System.



This cut-away view shows all elements of the acidizing operation. Hose from the hydrochloric tanks in the truck runs to the valve on the well connection. The second valve is for subsequent venting of spent acid. The perforated bottom of the tubing facilitates the dispersion of the solution throughout the limestone formation. The oil seal and packer, above the acid, keep the solution from rising up the sides of the casing.

Left, the line that will carry hydrochloric solution to the well in the pumping in process, being checked at the truck.

Right, engineers prepare themselves for the initial roar that will accompany opening of the vent pipe as spent acid is ejected under pressure.

from solution or intervention of organisms.

The chemical explanation shows why. The hydrochloric acid (HCl) that is pumped in reacts with the $CaCo_3$ and produces CO_2, calcium chloride ($CaCl_2$) in solution, and water (H_2O). The lime is eaten away and the acid enlarges the porous openings in the formation so that pressurized gas will be able to flow more freely to the well tubing.

If there is an abundance of impurities in the lime, they may react with the HCl to make compounds that actually stop the flow of gas through porous pay. Dolomite, $CaMg(CO_3)_2$, a carbonate formed from joining of magnesium and calcium commonly without fossil or shell material, which is mainly magnesium carbonate, is a rock strata that will give some unfavorable reactions with HCl.

While there are several ways in which the HCl solution may be injected into the well, usually a "packer" is employed. The packer, attached at the bottom of the tubing placed inside the well, is made partly of rubber so that it expands to the wall of the well and keeps the acid from flowing up the side of the casing, outside the tubing, and out the wellhead. Ordinarily a barrel of oil is injected in the well before the acid is forced in. The oil, lighter than the acid, remains between the packer to protect it from the acid. See the accompanying drawing.

Hydrochloric is injected into the well

The HCl is brought to the well in large tank trucks with coupled pumping units. Two tanks are mounted on a truck, each tank holding 4,000 gallons of hydrochloric acid in solution. The strength of the solution is a variable factor, being determined by the rate of production, the nature of the underground structural formation and the amount of underground reserves. The solution may deviate above or below 15%.

Once the preliminary steps have been taken to insure that the acid will stay in the rock strata and not escape around the sides of the tubing, the tanks of HCl are hooked up to the well mouth. From 1,000 to 5,000 gallons of acid are pumped into the well.

For about 30 minutes the acid is permitted to eat the lime and then a valve at the wellhead is closed and the pressurizing pump and other acidizing equipment are disconnected.

All mobile equipment is moved from the immediate vicinity, and a suitable pipe is placed in position at the wellhead to vent the well at a safe point.

The valve is opened and a white mist of "spent acid," the HCl reacting with the $CaCO_3$, is ejected by the mounting rock pressure of the natural gas and the CO_2 that was produced underground during the acidizing period.

In difficult cases it is sometimes necessary to "swab out" some of the older or low-pressure wells that lack the rock pressure to eject the spent acid. By creating a vacuum in the well, the carbon dioxide and natural gas rush toward the wellhead to fill this vacuum.

The well may be open for an hour or more with the spent acid pouring out in a thick, hissing cloud. Gradually, as the pressure within subsides, the loud hissing noise diminishes and a reading is taken with an open-flow gauge. The reading indicates the new rate of production. It may have increased from three to fifteen times as much as the open flow before the acidizing operation.

The principles of the acidizing technique can be likened to a sponge full of liquid under pressure. If a glass tube were to be stuck into the sponge, the liquid would rise up and flow out of the tube. If the small passages in the sponge were enlarged around the base of the tube so that the liquid, under pressure, could enter it more easily, there would be an increase in the amount of liquid flowing from the top of the tube.

By substituting the sponge for a strata of limestone, and a liquid under pressure for natural gas, it is easy to see why acidizing helps increase the flow of gas from the pay in a limestone formation.

Left, a white mist of hissing spent acid being forced out at the open vent by mounting rock pressure at the bottom of the well. Right, an engineer of Dowell, Inc. hauling disconnected acid line.

Variety of Gas Utility Legal Questions Answered by Court Decisions

by Leo T. Parker
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THE courts have ruled on a wide range of legal tangles that have direct gas industry application. The decisions are extremely useful as guides for company policy and action.

"If a contractor's employee does his work negligently thereby causing a gas explosion and damage to private property, who is liable?"

Answer: The contractor is liable.

For example, in Baldridge v. Wright Company, 96 N.E. (2d) 301, the testimony showed that a contractor was employed to make a connection between a gas line and a gas water heater in the basement of a dwelling. The contractor's employee wired the automatic shut-off valve on the heater in the open position to secure the desired flow of gas and thereby destroyed its effectiveness as a safety device. Later, the gas flame under the water heater went out and the property owner was injured by an explosion when attempting to relight the heater.

The higher court awarded damages to the property owner and held that the contractor's employee, in wiring open the valve, was the proximate cause of the explosion, particularly as no evidence was produced tending to show that some other factor was probably responsible for the explosion.

"The undisputed testimony shows that plaintiff (property owner) was not familiar with the mechanical workings of a gas water heater," the court said. "He employed and paid defendant (contractor) to make the gas connection and had a right to assume that this would be properly and safely accomplished."

Service is discontinued

A letter from an official of a gas company had this problem: "Our company has adopted rules and regulations which provide that if a gas consumer has a delinquent account with our company, anywhere, we will cut-off and discontinue his service. If a consumer owes money for gas furnished in one location can we lawfully discontinue his service in another location?"

Within the past two months a higher court rendered a decision which answers this question.

A public utility adopted rules and regulations which provide that the company may refuse to render service to any applicant indebted to the company "for service rendered at another location until the customer has paid, or made satisfactory arrangements to pay such indebtedness and has complied with other requirements for service." Berner v. Interstate Power Company, 57 N. W. (2d) 55.

A person named Berner resided in the gas company's service area and operated a restaurant at another location, also in the service area. The business was discontinued with a bill of $129.56 due to the utility company. The company discontinued service at the residence, although there were no arrears for that address. The residential service was discontinued solely because of the utility's rules, relating to the delinquent bill for service supplied to the restaurant.

In subsequent litigation the higher court held that the utility company could not lawfully discontinue service to the residence, although he still owed a bill for service rendered at the restaurant.

The court held "the issue to be: 'Whether or not a public utility company may discontinue or deny service to a patron refusing to pay a past due undisputed bill for service regardless of the address to which rendered.' We hold that if the rule be to the effect that the appellee (gas company) may discontinue service at an address which is the homestead at which there is no arrearage for service furnished, because said consumer refuses to pay for past-due service for some other and independent use, or at some other place, such rule is unreasonable as exacting from the appellee's patrons something to which it was not entitled under the law."

For comparison, see Miller v. Roswell Gas & Electric Company, 32 N. M. 594, 166 P. 1177. Here, the court said, "that it (gas company) has the right to demand payment in advance, or a reasonable deposit to secure payment for the contemplated service, is undisputed, but it cannot refuse to furnish service to a building or residence because the proposed consumer owes it a past-due obligation for service at some other and distant place, or for some other service. For the collection of such accounts the law affords public service companies the same remedies enjoyed by others. Such companies have no right to withhold such service for the purpose of enforcing the payment of past-due indebtedness, unless such indebtedness is incurred for the current use of the same upon the premises supplied."

Also, see Gaslight Company of Baltimore v. Colliday, 25 Md. 1; Southwestern Gas & E. Co. v. Stanley, 123 Tex. 157, 70 S. W. (2d) 413; Lloyd v. Washington Gaslight Company, 1 Mackey 331. For authority to the contrary see DePass v. Broad River Power Co., 173 S. C. 387, 176 S. E. 325, 95 A.L.R. 545; Mackin v. Portland Gas Co., 38 Or. 120, 61 P. 134, 49 L.R.A. 596; People v. Manhattan Gas Light Co., N.Y. 45 Barb. 136.

Municipal v. private gas company

A recent and unusual letter from a reader calls for unusual law and citations of higher court decisions.

"What are the legal distinctions between an ordinary municipal corporation and the gas department of a municipality? Can all cities engage in the business of selling gas to consumers?"

First, a consideration of the legal rights and duties of municipalities. All courts recognize that a municipal corporation, in its historical and strict sense, is an incorporation by the authority of the government. The power of local government is the distinctive purpose and the distinguishing feature of a municipal corporation. While the phrase "municipal corporation" usually is used in the strict sense, yet sometimes it is used in a broader sense and which includes also public or quasi corporations, the principal purpose of whose creation is an instrumentality of the state, and not for the regulation of the local and special affairs of a compact community. A municipality which is authorized to sell gas is not, in a strict sense, a pure municipal corporation. In other words, its usual or ordinary powers must be broadened by state laws, before it can enlarge its ordinary powers of legislation and regulation of its internal affairs.

The rule has been long established that a true municipal corporation possesses and can exercise the following powers and no others: First, those expressly granted by state laws; second, those necessarily or fairly implied in or incident to the powers expressly granted; third, those essential to the declared objects and purposes of the corporation not simply convenient, but indispensable.

The powers normally granted to a municipal corporation can be divided into two general classes: first, including

those which are legislative, public or governmental, and import sovereignty; second, those which are proprietary or quasi private, conferred for the private advantage of the inhabitants and the city itself as a legal entity.

Modern higher courts consistently hold that where a municipality acts strictly in its legislative, public, or governmental capacity it can neither sell gas, nor engage in the business of selling gas appliances. However, where the city has powers granted by state laws to assume these proprietary duties, or engage in private business, the courts hold that the implied powers of the municipality are exactly the same as the powers acquired by a private gas corporation through similar provisions in its charter.

See following higher court cases which explain all various phases of this law: MacRae v. Concord, Mass., 6 N. E. (2d) 366, 108 A.L.R. 1450; Keen v. Mayor of Waycross, 101 Ga. 588; Attorney General v. Leicester, 2 Ch. Div. (Eng.) 359; 14 N. E. (2d) 392, 115 A.L.R. 1158; and Adie v. Mayor of Holyoke, 21 N. E. (2d) 377.

Hence, according to these various higher court decisions, an ordinary municipal corporation cannot engage in the business of selling gas or gas appliances.

When gas company delays service

"Under what circumstances is a gas company liable in damages to a gas consumer who claims that he was damaged or made ill by delay of the gas company in connecting his gas service, or turning on gas?"

A late higher court decision held that a gas company may be negligent in failing to connect gas service within a reasonable time after the application is filed, yet the company can avoid liability on proof that the consumer failed to use reasonable care to protect himself against damage or illness.

A dwelling owner called at the office of the gas company on the evening of the 7th, for the purpose of ascertaining how early the gas could be turned on in his house. He was advised by the company's employes that it could be turned on immediately "after your deposit is made." On the morning of the 8th, the owner went to the office of the gas company and made the required deposit. His family arrived at the dwelling close to noon. Then he telephoned to the gas company and was informed that the gas would be turned on "soon." The family went to a neighboring house, where they were comfortable, but the owner remained in and about the house until the mechanic arrived at around 4 P.M. It was "zero" weather, and following the installation the owner became ill, with pneumonia, and was confined to bed for six weeks. He sued the gas company for heavy damages.

The important evidence introduced by the owner, to establish negligence of the gas company, was that he had ordered the gas turned on some time between 9 and 10 A.M. and it was not turned on until 4 P.M.

This question was presented to the court: Was the gas company's delay unreasonable, and did the owner use ordinary care to protect himself against injury and illness while waiting for the gas company to turn on the gas?

It is important that the higher court held the gas company not liable.

"Even if it could be said that there was unreasonable delay in installing this meter," the court said, "such delay was not the proximate cause of [the owner's] injury. The consequence of the negligent act must be within the range of probability as viewed by the ordinary man, and consequences which are merely possible cannot be regarded as either probable or natural. . . . The gas company could not reasonably have anticipated that [the owner], a man of mature years, would remain exposed, idle, and inactive in this unheated house in zero weather for some 7 hours."

Therefore, in this case the owner was denied any damage allowance because his own negligence resulted in his illness.

This court further said, "The proximate cause of [the owner's] injury, so far as they arose from his exposure in this unheated house, was the voluntary and entirely unnecessary act of the plaintiff, an intelligent and responsible human being, and not the act of defendant in delaying in installing the meter."

Fort Smith Gas Co. v. Cloud, 75 Fed. (2d) 413.

Employee is abusive

"What is the line of distinction where a gas company is liable or is not liable for abusive acts by its employees toward gas customers?"

New law has been laid down to the effect that a gas company is liable for "abusive" acts of its employees who entered customers' homes to attend to the company's business.

In Digsby v. Carroll Company, 47 S. E. (2d) 203, it was shown that an employee of the Carroll Company went to a home to collect a small bill. The housewife sued the company for damages because its employee became unusually boisterous and used vulgar and abusive language to her and threatened to take something from the house to get the money owing to company.

The higher court held the company liable.

"The courts have settled down to the commonsense doctrine that a master is liable for the torts of his servant, committed in the course of the servant's employment," the court said.

Insurance company sues gas utility

Another reader asks "If a dwelling is destroyed by fire resulting from an explosion of gas, and an insurance company pays the fire loss, is the gas company relieved from further or any liability?"

According to a late decision, the answer is no. On the other hand, if the evidence is in honor of the gas company, the insurance company cannot recover a favorable verdict.

For illustration, in London Company v. Gas Service Company, 200 Fed. (2d) 783, the testimony showed that a gas company received an application from the owner of a new dwelling to turn on the gas. The gas company had the dwelling owner sign a contract which contained this clause: "I hereby represent that the service lines, pipes and appliances into which gas is to be delivered are my property and have been properly inspected, are suitable for the reception of gas and will be so maintained by me."

Soon after the gas was turned on an explosion occurred. The testimony showed that the gas piping on the premises, including the service line leading from the gas company's distribution main in the street and the gas line in the house, was installed by a plumber employed by the owner of the property.

Further evidence proved that at the time the connection was made gas was escaping from the sub-standard connection in the service line, and that the escaping gas followed the line of least resistence through the loose earth in the trench in which the service pipe was laid into the basement of the residence where the explosion occurred. Neither the gas company, nor the city plumbing inspector, nor the property owner made any pressure test of the service line before the gas was turned on. It is undisputed in the evidence that if such a pressure test had been made the defect would have been discovered.

When the explosion occurred the dwelling caught fire and burned. The insurance company paid the owner of the dwelling and then sued the gas company. In view of the evidence, the higher court refused to hold the gas company liable to the insurance company, saying. "While it is admitted that the gas company never made a pressure test of the service line, it is also admitted that the owners never requested and never made the pressure test of the service line required. . . . The gas company had no knowledge of the defect in the service line. Moreover, it is a fair inference from the evidence that the service line was not constructed in conformity to the regulations."

Bond Market Recovering From Jitters

Financing Prospects Improving Gradually

by John F. Falvey

Financial Editor

John F. Falvey

THE corporate bond market has been giving a better account of itself during recent weeks. True, the improvement of seven basic points for high grade bonds in the past four weeks is slow in relation to the speed with which the market previously had deteriorated, but however gradual the betterment now in evidence, it certainly is a step in the right direction.

Several factors can be cited as contributing to the improvement; changing Treasury financing policies, a slackening in the hitherto heavy rate of new corporate bond issues and the anticipation that additional offerings over the remaining months of this year will not be heavy.

The law of supply and demand is expected to be the prime determinant of interest rates for the balance of this year at least, now that the Treasury has abandoned its intention to compete directly in the market with private borrowers for long-term funds on a yield basis.

In fact, if any concrete proof of this is necessary it is afforded in the recent lowering of reserve requirements by Federal Reserve member banks, plus the announced policy of the Federal Reserve that it would endeavor to counterbalance Treasury deficit financing and seasonal increase in bank credit requirements.

To attain this desired end a return to open market purchases of Treasury bills and possibly other Treasury obligations presumably will be witnessed.

The end of efforts to fund the public debt into long range securities and the decision of the Government to employ Treasury bills to finance the large deficit in sight for the current year means that interest rates for the months ahead will be governed solely by corporate need for money and the volume of savings which is available for the purpose.

After attaining a high level of new offerings in the first six months of this year—which saw the utility industry alone marketing a 14% greater dollar amount of new securities than in the comparable 1952 period—the new offerings in prospect for the balance of the year are expected to be of much more manageable proportions. Many corporations raised the bulk of their needed expansion funds in the mad scramble which did much to precipitate the unsettled market situation of several months ago. Then too, corporate tax payments should be considerably smaller in the final six months under the Mills plan and an expanding proportion of new funds will be supplied by retained earnings and depreciation reserve accruals.

Also of favorable import is the flow of savings into financial institutions at a faster rate than a year ago.

While some prophets of financial and economic doom deplore the doubling of all debt—both long-term and short-term—which has taken place in the eight short years since the end of the war, profits have kept pace by also doubling in the same time. Furthermore, a considerable part of the debt issued during these recent years is protected by serial maturities and/or sinking funds which call for rapid scale-down of principal amount; in numerous instances depreciation reserve accruals alone should provide sufficient funds to take care of the serial maturities or sinking funds.

If the favorable opinion expressed recently by the conservative National City Bank of New York is any criterion, no fear need be entertained with respect to early halting of the flow of individuals' savings into the hands of institutional investors. While individual debts have grown to a staggering $99 billion, the National City points out, the people are creditors to the tune of $363 billion, or a ratio of $3.66 of savings to every dollar of debt. The bank does not share concern expressed in other quarters over this debt because it is widely distributed and comparatively few families of individuals have debts which exceed $500, or 10% of their income.

Corporate working capital also has been improving. At last report the total for the country stood at an estimated $86.9 billion, a new high level, for an improvement of $1.3 billion in the first quarter of 1953 alone and $3.7 billion above the comparable date a year ago.

The creeping improvement in the bond market has been duplicated by common stock prices, with the stimulus to share quotations traceable chiefly to the scheduled demise in a few months of the excess profits tax and to the flat reduction in sight for individual income taxes starting next January 1. Reduction in the personal tax levy and consequent

(Continued on page 40)

INDEX OF YIELDS : SELECTED UTILITIES STOCKS

	July 1953	June 1953	May 1953	Apr. 1953	Mar. 1953	Feb. 1953	Jan. 1953	Dec. 1952	Nov. 1952	Oct. 1952	Sept. 1952	Aug. 1952
Natural Gas Transmission Companies	4.76%	4.72%	4.34%	4.18%	4.04%	3.95%	4.04%	4.04%	4.14%	4.48%	4.44%	4.10%
Natural Gas Transmission & Distribution Companies	5.41	5.55	5.28	5.06	4.91	4.91	5.02	4.99	5.14	5.47	5.45	5.30
Manufactured & Mixed Gas Companies	5.06	5.08	4.80	4.73	4.63	4.65	4.87	4.83	5.00	5.04	4.80	4.70
Class "A" Electric Companies	5.41	5.53	5.18	5.14	4.97	5.05	5.08	5.10	5.20	5.40	5.39	5.40
Class "B" Electric Companies	5.41	5.68	5.35	5.06	4.93	5.08	5.19	5.08	5.19	5.47	5.42	5.46

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

FEDERAL POWER COMMISSION

Operating Revenues and Income in April

Operating revenues of natural gas companies reporting to FPC totaled $205,067,212 in April, an increase of 22.5% over April, 1952. For the 12 months ended April 30, 1953, revenues aggregated $2,090,074,650, or 19.1% higher than in the same 12 months of 1952.

Gas utility operating income for April, 1953, amounted to $30,955,912, up 6.5% from April of last year. For the 12 months ended April 1953, gas utility operating income was $298,532,376, an increase of 12.1% over the comparable 1952-period.

Net gas utility plant of the reporting companies aggregated $5,085,427,169 on April 30, up 10.8% over a year ago.

Gas operating revenue deductions during April amounted to $174,274,936, an increase of 25.8%. Of this total, operating expenses accounted for $130,778,486; depreciation, $15,315,605; taxes, $28,180,845.

Gas sales to ultimate consumers during the month were 243,569 MMcf, an increase of 6.3% over April 1952.

Sales to residential and commercial consumers decreased 0.9% and 2.0% respectively, while those to industrial consumers increased 11.8%. Revenues from the three classes of service increased 7.7%, 6.7% and 22.9%, respectively. Revenues from all sales to ultimate consumers increased 12.7%.

Net income of the companies for April 1953, was $23,621,101, up 3.2% from 1952. For the 12 months ended April 1953, net income of $215,206,149 represented an increase of 5.1% over the comparable 1952-period.

Panhandle Denied Request to Serve Industrial in Utility Area

A presiding examiner has filed a decision, subject to Commission review, denying requests by Panhandle Eastern Pipe Line Co. to render industrial gas service to Bohn Aluminum and Brass Corp. at Adrian, Mich., and for a certificate authorizing a pipeline in the Adrian area.

The decision said that Panhandle is presently unable to make a lawful actual delivery to the Bohn plant, either through its own facilities or those of Citizens Gas Fuel Co., of Adrian.

Panhandle's application requested authority to make deliveries to Bohn through the facilities of Citizens. In a related application, Panhandle sought a certificate for a pipeline to parallel its existing line to Adrian, to permit deliveries to Bohn and Citizens during the winter months when large volumes of gas must also be delivered to Citizens. Temporary authorization for the construction and operation of this line and service to Bohn was granted last October.

The examiner pointed out that at the time the Bohn-Panhandle contracts were executed, Citizens had ample pipeline capacity to enable it to serve the plant, and previously had sought to purchase interruptible gas for resale from Panhandle. Panhandle, however, declined to sell this gas, the examiner asserted, and thereby violated provisions of its gas tariff. By the violation, Panhandle "has wrongfully deprived" Citizens of the right to serve all the natural gas requirements of its customers in its franchise territory.

The decision states that the service of transporting and delivering the gas for hire, as Citizens would do for Bohn, would render that company a "natural-gas company" under the Natural Gas Act, but that Citizens has neither sought nor obtained a certificate from FPC.

Iroquois Corp. to Develop New York Storage Area

A certificate to Iroquois Gas Corp. authorizes construction of pipeline facilities in connection with the development of the Aurora field near Aurora and Colden, N. Y., as a storage area for natural gas.

Under the authorization, Iroquois will develop the Aurora field to an estimated capacity of approximately 1.6 MMMcf of active gas and a base of 2.4 MMMcf. The company also will construct about 6 miles of 16-inch pipe extending from the storage field to the point where its system connects with the facilities of Tennessee Gas Transmission Co.

Iroquois said that it needs to develop the additional storage to achieve reasonable operating flexibility and to permit it to purchase Southwest gas at a 100% load factor.

Lone Star to Change Service to 4 Texas Towns

The Commission has issued an order permitting Lone Star Gas Co. to abandon the interstate service, as previously authorized, and instead to supply four Texas communities with gas produced in Texas. The four communities previously received gas by pipelines through which gas produced in the Panhandle Field of Texas was transported through Oklahoma and back into Texas for ultimate delivery to these towns.

El Paso to Purchase Facilities from West Texas

A presiding examiner's decision, subject to review by the Commission, grants a series of related applications by El Paso Natural Gas Co. to acquire pipeline facilities from West Texas Gas Co. now used by West Texas to supply natural gas to Southern Union Gas Co.

The gas which West Texas now sells to Southern Union is purchased from El Paso, and the transaction will eliminate West Texas as a "middle man" in the operation. The decision authorizes the transaction upon condition that El Paso shall either adopt the West Texas 13½ cent per Mcf rate, or if it charges the 15½ cent rate as it proposes, the increased amount is to be under bond and subject to refund, as it is doing in a general rate increase case applicable to its existing system now pending before FPC.

American Gas Fundamentals OUTLINE

NATURAL GAS
- *Geology
- *Drilling and completion
- *Methods of estimating reserves
- *Chemicals from gas
- *Natural Gas Conservation

MANUFACTURED GASES
- *Coke oven gas; producer gas, blue gas; carbureted water gas
- *Reformed gas
- *Hi-Btu oil gas
- Interchangeability

LIQUEFIED PETROLEUM GASES
- *Sources, properties and uses

BASIC GAS LAWS
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TRANSMISSION
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GLOSSARY
- *Ab-to-Ex

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How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

Glossary of Gas Industry Terms: Fah to Gen

F

FAHRENHEIT Temperature scale commonly used in U.S.A. in which water freezes at 32°F and boils at 212°F at normal atmospheric pressure.

FALLING SEAM A depression along a weld on the outside of a butt-welded pipe.

FAN BLOWER OR BOOSTER (See Blower.)

FAN MIXER A fan or blower to which gas is admitted to mix with air.

FAT GAS (See Wet gas.)

FAULT An underground fracture or slippage of rock which has brought a permeable or porous layer of rock into lateral contact with an impermeable layer, thereby trapping any gas or oil moving through the permeable rock at the line of the fault.

FE Chemical symbol for iron.

FEDERAL POWER COMMISSION An agency of the government of the United States which has jurisdiction over the construction, operation and rates of interstate natural gas pipelines that sell gas for resale. With respect to the gas industry, the general regulatory principles of FPC are defined in the Natural Gas Act, as amended.

FEED Raw materials fed into a piece of equipment.

FEED POINTS Connections between gas feeder lines and distribution networks in local gas distribution.

FEED WATER Water fed to a boiler for conversion to steam, consisting of condensed exhaust steam and make-up water to replace losses of steam.

FEED WATER HEATER A heat exchanger heated by direct fires, hot flue gases, or steam and used to preheat the feed water before it is sent to the boiler.

FEED WATER PUMP A pump for forcing feed water into a boiler against the steam pressure within the boiler.

FEED WATER TREATMENT The removal of materials causing boiler scale from boiler feed water by chemical treatment.

FEEDER (FEEDER MAIN) A comparatively large size gas pipe that delivers gas from the city gate or the gas holder to the distribution networks or grids.

FERRIC Chemically, a specific form of iron in a chemical compound in which the iron is trivalent.

FERROUS Containing iron, a general term; chemically, a specific form of iron in a chemical compound in which the iron is divalent.

FERY PYROMETER Temperature measuring instrument in which radiation from heat source is focussed on a small thermocouple and the resulting current generated read on a galvanometer scale calibrated in degrees of temperature of the heat source.

FIELD MAINS Pipes transporting natural gas from individual wells to processing point, compressor stations or transmission pipeline.

FIELD PRESSURE The pressure of natural gas as it is found in the underground formations from which it is produced.

FILLET WELD An approximately triangular cross-section weld resulting when two surfaces, more or less at right angles to each other, are welded together.

FILTER A mechanical means of removing solid materials from a liquid or gas; so constructed that the fluid passes through the filter and the solids are held back.

FILTER AID Finely-divided solid or fibrous material used to increase the speed and efficiency of filtering.

FIN-FAN COOLER A dry cooler that passes cooling air over finned tubes through which some hot fluid is being passed during the cooling processes. A variable speed fan is used to regulate movement of air over the finned tubes.

FIRE In boiler or furnace operation, the act of feeding fuel to the furnace whether by hand or mechanically.

FIRE BOX The space within a furnace in which fuel combustion takes place.

FIRE BRICK Fire resistant material formed into bricks and used to line fire boxes of boilers, furnaces or other combustion chambers.

FIRE BRICK ARCH An arch built of fire brick, within a fire box, to aid in complete combustion of fuel and radiation of the flame heat.

FIRE CLAY A special kind of clay that will not melt or fuse at high temperatures.

FIRE DOOR In hand-fired furnaces, the door through which fuel is fed to the fire. The same as the clean-out door in other furnaces.

FIRE POINT Minimum temperature at which a substance will continue to burn after being ignited.

FIRE VALVE A safety valve installed at the inlet of gas meters set inside buildings and so designed that the gas supply will be shut off when the valve is heated to a certain temperature.

FIRING RATE The rate at which fuel or an air fuel mixture is fed to a burner; expressed as volume, heat units or weight per unit time.

FISCHER-TROPSCH PROCESS Hydrogenation of water gas (produced from reaction of coal, lignite or petroleum hydrocarbon and steam) at 1-10 atmospheres pressure and 360-410°F to obtain fluid and gaseous fuels and paraffin wax.

FISHTAIL BURNER A tip for a gas burner that produces a wide flat flame that is somewhat fishtail shaped.

FITTING A device, usually metal, for joining lengths of pipe into various piping systems; include valves, couplings, ells, tees, crosses, reducers, unions, caps and drips.

FIVE LIGHT METER The smallest size gas meter usually installed for a domestic consumer.

GLOSSARY

FIXATION, FIXING The application of heat to transform an oil vapor into a gas.

FIXED AMMONIA COMPOUNDS Chemical compounds of ammonia from which the ammonia cannot be driven by heat alone.

FIXED (RESIDUE) CARBON The remainder of coal after deducting for the volatile matter, moisture and ash.

FIXING CHAMBER A heated checker chamber, the last through which gas passes in the manufacture of hi-Btu oil gas, and in which the gas is further cracked and stabilized.

FLAME DESCALING Removal of scale from steel by differential expansion caused by very rapid heating with a gas or oxy-acetylene torch.

FLAME FRONT The base of a flame at which combustion starts.

FLAME PRIMING Heating of steel surface with a gas torch to remove scale, moisture and rust before painting.

FLAME PROPAGATION The rate at which a flame will travel through a combustible mixture of fuel and air.

FLAME RETENTION BURNER A burner so constructed that the main burner nozzle is surrounded by small pilot light ports which will re-ignite the main nozzle in case the flame is blown out.

FLAME TEMPERATURE The maximum temperature of a flame, measured in degrees of Fahrenheit or Centigrade.

FLAME VELOCITY The speed at which flame progresses through a fuel-air mixture.

FLAME WELDING Welding with an oxy-acetylene or gas torch as distinguished from electric arc welding.

FLANGE A plate of material set at right angles to the surface to which it is attached and usually used to fasten two sections of material together.

FLANGE PIPE Pipe with flanges attached so that the ends of pipe sections can be bolted together.

FLANK DRILLING The drilling operation at the currently-known limits of existing gas or oil fields.

FLARE Burning of gas from a gas well or from a gas-oil separator, for the purpose of safe disposal.

FLASH BACK The burning of gas in the mixing chamber of a burner, or in a piping system, due to an excess of primary air or to slowness of gas flow.

FLASH POINT The minimum temperature at which the vapors above a liquid fuel can be ignited by an open flame.

FLAT FLAME BURNER A burner so designed that it produces a wide flat flame.

FLEXIBLE COUPLING A mechanical connection between two pieces of machinery or two pipes to allow movement of the two parts independent of each other.

FLEXIBLE GAS HOSE A flexible pipe or hose for attaching a gas appliance to a rigid gas outlet pipe.

FLOATING FLAME (FLAME BLOW-OFF) A flame that burns above the burner tip with a section of unburned gas between; caused by too great a gas velocity out of the burner tip.

FLOATING TANK A water tank suspended within a hot water heater shell so that the hot gases of combustion pass between the tank and the shell to heat the water.

FLOOR FURNACE A furnace mounted in the floor and suspended between the floor beams. Supplies warm air heat through a grill in the floor on top of furnace and does not require air ducts.

FLOW COEFFICIENT A factor used in computing the rate of flow of a fluid through an orifice.

FLOW FORMULA In the gas industry, a physical formula for determining the flow of gas between any two points in a pipeline under various conditions.

FLOWING WELL (OIL) One in which oil flows at the surface due to the natural underground pressures.

FLOW METER A device for measuring the rate of flow of a fluid.

FLUE A pipe for carrying hot combustion gases out of a combustion chamber to the atmosphere, or to a heat exchanger.

FLUE GAS ANALYSIS A quantitative analysis of the various components in flue gas, expressed generally in percentages of volume.

FLUE GAS LOSS (STACK LOSS) The sum of the sensible heat in dry flue gas plus the sensible and latent heat in the water vapor it contains.

FLUE GASES The gases resulting from combustion of a fuel.

FLUID A non-solid substance or material that will flow, such as a gas or liquid.

FLUIDITY The ease with which a fluid substance will flow.

FLY-ASH Fine particles of ash that are deposited within a furnace or rise through the chimney flue to the surrounding atmosphere.

FOAMING The formation of a mass of relatively stable bubbles on the surface of a liquid.

FOLD In geology, an uplifting and bending of rock strata due to earth movement, resulting in a wrinkle or fold in the strata. May serve as a trap for gas and petroleum.

FORCED DRAFT The blowing of combustion air into a combustion chamber, thereby forcing a draft through it.

FOREIGN STRUCTURES With respect to gas mains, the water and sewer pipes, telephone, telegraph and electric cables buried under city streets.

FORMATION A geological term applied to an underground stratum; in the gas industry, usually the one from which gas or oil is produced.

45° BEND OR ELL A fitting for connecting two sections of pipe together at a 45° angle to each other.

F.O.T. EFFICIENCY Fuel-oil-tar efficiency. The efficiency of a carburetted water gas plant, measured as the ratio of the heating value of the gas and tar produced to the heating value of the fuel and oil consumed, per unit volume of gas produced.

FOUL GAS Unpurified manufactured gas.

FOUL MAIN The pipe carrying gas to the purifying section of a manufactured gas plant.

FOULED OXIDE Iron oxide used in purifying manufactured gas which has absorbed all impurities, chiefly hydrogen sulphide, that it can hold.

FOUNDRY COKE A grade of coke especially adaptable to the making of cast iron.

FREE AMMONIA Ammonia in combination with other materials from which it can be driven by the application of heat.

FRICTION FACTOR A factor used to compute the decrease in pressure and flow due to friction of a fluid flowing through a pipe.

FUEL A substance that will burn under controllable conditions furnishing heat in a usable form.

FUEL-AIR RATIO The ratio of the rate of fuel supply to

the rate of air supply required to obtain the desired combustion characteristic.

FUEL BED In the case of solid fuels, the mass of fuel on the grate of a furnace.

FUEL CLAUSE A provision in a manufactured gas sales contract that allows an increase or decrease in the gas price as the price of fuel used to make the gas goes above or below the fuel price set in the contract.

FUEL EFFICIENCY The percentage of total heat input which is utilized for work in any given operation involving the burning of a fuel.

FUEL OIL Oil that can be used as a fuel in properly designed and operated equipment.

FUEL RESOURCES, NATIONAL The national totals of the natural underground deposits of solid, liquid and gaseous fuels; also the potential electric generation from water power, available for production throughout the United States for useful purposes. The totals may be expressed in terms of the unit of measure for each source of energy or those units may be converted to the common unit, the therm (100,000 Btu).

FUEL VALUE A measure of the amount of heat available from the combustion of a unit weight or unit volume of a fuel. Usually expressed as Btu per pound or per cubic foot.

FULL-AUTOMATIC CUT-OFF PROTECTION An automatic control on a gas-using appliance which shuts off the gas to the unit if the pilot light flame goes out.

FURNACE A piece of equipment for the controlled-combustion of a fuel.

FURNACE BLACK Carbon black manufactured by the partial combustion or thermal decomposition of natural gas or other hydrocarbons in a furnace with a limited supply of air to prevent complete combustion.

FURNACE PRESSURE The pressure existing within the combustion chamber of a furnace. It may be positive if it is greater than atmospheric pressure, negative if less and neutral if the same.

FUSE The melting or partial melting followed by joining of normally separated material into a larger mass. To join adjacent edges of sheet material by melting them together.

FUSING OR MELTING POINT The temperature at which a solid substance will melt.

FUSION POINT The temperature at which a substance can exist in a solid and liquid state in equilibrium.

G

GALLERY The top space, above the diaphragm chambers, in a tin case gas meter.

GALLING The peeling or stripping of pipe threads.

GALLON A U.S. gallon contains 231 cubic inches. A U.S. gallon of distilled water at its maximum density and 30 inches of mercury barometric pressure weighs 8.3389 pounds avoirdupois.

GALVANIZED STEEL PIPE Zinc coated steel pipe in which the zinc retards corrosion.

GAMA Abbreviation of Gas Appliance Manufacturers Association.

GANG A crew of workmen of any size.

GANG PUSHER A supervisor in charge of a work gang.

GANTRY A traveling crane with tracks at ground or floor level and on legs high enough for the crane to carry a load over the tops of obstructions.

GAS An aeroform which has neither independent shape or volume. It is one of the three forms of matter: solid, liquid and gaseous.

GAS ABSORPTION Taking up of gas by another material.

GAS-AIR DRIVE The injection of a mixture of gas and air into oil sands to increase the production of oil.

GAS BAG A gas-proof, inflatable bag which can be inserted in a gas pipe and inflated to seal off the flow of gas in the pipe.

GAS BALANCE An instrument for determining the weight of a gas; i.e., its gas gravity.

GAS BLACK (See Carbon black.)

GAS BOOSTER A blower or compressor used to increase the pressure in a gas system.

GAS BRAZING Brazing in which a gas flame is the source of heat. (See Gas welding.)

GAS BURNER A mechanical device designed to mix gas and air in the proper proportions for combustion and maintain the flame at the burner outlet.

GAS CAP A layer of gas on top of oil in an oil bearing underground structure.

GAS CARBON A hard form of carbon formed as a by-product of the manufacture of coal gas.

GAS CARBURIZING Carburizing of steel in which the carbon is supplied by hydrocarbon gases and carbon monoxide.

GAS COAL Coal containing a high percentage of volatile components; of good quality for coal gas manufacture.

GAS COKE Coke from bituminous coal that is used in manufacture of coal gas.

GAS CONDITIONING The removal of objectionable constituents and addition of such desirable constituents as odorants, water vapor and fogging oil.

GAS CYCLING A petroleum recovery process which takes gas produced with oil and injects it back into the oil sand to aid in producing more oil.

GAS DEGENERACY (GAS DEGRADATION) Departure from classical behavior, at very low temperatures for an ideal gas.

GAS DETECTOR A device for indicating the presence of a particular gas.

GAS-DISTILLATE A natural gas containing a high proportion of gasoline hydrocarbons.

GAS ENGINE An engine, burning fuel which is normally gaseous, and having spark ignition.

GAS FACTOR The cubic feet of gas produced from a well per barrel of crude oil produced.

GAS FIELD A district or area from which natural gas is produced.

GAS FURNACE A furnace using gas as the fuel.

GAS GRAVITY The ratio of the weight of volume of gas to the weight of an equal volume of dry air both volumes being measured at the same temperature and pressure.

GAS HANDLING That part of a gas making process following the gas making equipment.

GAS HOLDER A gas-tight shell for gas storage. Low pressure holders vary their capacity directly with the volume of gas stored in them, either by floating the tank over water or by means of a flexible sealing membrane. High pressure holders, cylindrical or spherical, increase the pressure as additional gas is stored in them.

GAS HYDRATE An objectionable frost-like formation that occurs when natural gas containing water vapor is subject to pressure.

GLOSSARY

GAS IMPURITIES Foreign matter, such as dust, water vapor, hydrogen sulphide, tar and ammonia, which is in gas but not useful as fuel.

GAS INTAKE The opening or part through which gas enters a piece of equipment.

GAS LAWS A term referring to the laws of Boyle, Charles Joule and Avogadro for perfect gases.

GAS LIFT The effect of gas pressure in an oil well which causes the oil to flow from the well. May be either natural or artificially induced.

GAS LOG A residential space heater made of porous ceramic material, in imitation of a log or pile of logs, over and around which a gas flame burns.

GAS MAIN A pipe used to transport gas from one place to another.

GAS MANTLE A small fragile sack made of fabric materials, impregnated with one part ceria and 99 parts thoria and used for illumination when heated to white heat in a gas flame.

GAS OFF-TAKE PIPE The gas outlet pipe from a coal gas retort.

GAS OIL A special grade of petroleum used in the production of carbureted water gas and oil gas.

GAS OUTLET The opening or port through which gas leaves a piece of equipment.

GAS PRODUCER A refractory-lined or water-jacketed shell with a fuel grate into which solid fuel is charged periodically and which provides for air and steam to pass continuously through the fuel bed, in the manufacture of producer gas.

GAS RESERVES The volume of gas that has been estimated by geologists to exist in known underground formations.

GAS SAND Sand or porous sandstone in underground strata that contains natural gas.

GAS SCRUBBER Equipment for washing objectionable impurities and foreign substances from gas.

GAS SERVICE The general term for serving the customer with gas; also, the pipe connection from a distribution gas main to a customer's meter.

GAS-STEAM RADIATOR A type of space heater in which a gas flame boils water contained in the unit, to make steam which circulates through the unit to heat the surrounding atmosphere.

GAS STOPPER An expandable diaphragm which can be placed in a gas pipe and expanded to shut off the flow of gas in the pipe.

GAS STRATUM The underground formation from which natural gas is produced.

GAS TAR A salable by-product of the coke oven and carbureted water gas processes.

GAS THERMOMETER A temperature measuring device which uses a gas as the recording medium.

GAS TORCH (See Torch.)

GAS TRAP A device or piece of equipment for removing (a) condensate from gas lines or (b) gas from crude oil. Also called a gas separator or an oil separator.

GAS TURBINE Power equipment of the turbine-type that utilizes the available energy in hot combustion gases as a motive force.

GAS WELDING Welding of metals by means of the heat of a gas flame.

GAS WELL A well producing only gas.

GAS WORKS A term for a manufactured gas plant.

GASIFICATION The conversion of another fuel into gas or the extraction of gas from another fuel.

GASKET Compressible, inert material, cut to shape, placed between the two faces of a joint to seal the joint so no fluid can pass through the faces of the joint.

GASOLINE A liquid hydrocarbon that is produced as a result of processing of crude petroleum or as a result of processing wet natural gas.

GASOLINE PLANT A plant in which gasoline fractions are removed from "wet" natural gas, leaving dry gas.

GATE, CUT-OFF OR COAL A plate or door in the outlet of a bin or hopper, used to regulate the flow of coal or other material from the bin.

GATE VALVE A valve in which the operating mechanism causes a flat plate or disk (gate) to seat tightly across the ports or openings in the valve body and thereby shut off flow through the valve.

GATHERING LINES A pipeline system that has as its purpose the delivery of gas from a number of gas wells to either a processing plant or a main transmission pipeline.

GATHERING STATION An operating station on a main transmission pipeline at which the gas gathering lines of a particular area converge.

GAUGE In the gas industry, indicating or recording devices which measure such gas characteristics as temperature, pressure or flow rate.

GAUGE GLASS A glass tube set on the outside of a tank or boiler, connected into the tank with one or more gauge cocks, used to indicate the internal liquid level.

GAUGE PRESSURE The pressure measured in excess of the pressure exerted by the atmosphere. (See Absolute pressure.)

GAUGER A person who measures the contents of tanks of liquids such as oil, gasoline and liquified petroleum gas.

GEAR A wheel with teeth around its periphery; used in various combinations to transmit power or change motion.

GEAR CASE A metal enclosure or case around gears.

GEAR PUMP A type of pump in which the liquid is trapped between gear teeth and carried around to the outlet of the pump.

GEAR RATIO The relationship of the revolutions of one of a pair of meshed gears to the revolution of the other gear. Also, the ratio of the number of teeth in one gear to the number of teeth in the second gear.

GEAR TRAIN A set of inter-connected gears transmitting motion from one point to another.

GENERATING CAPACITY, INSTALLED AND FIRM Installed generating capacity is the sum of the capacities of all gas generating units in a plant. Firm generating capacity is installed capacity less the capacity of the largest gas generating unit in a plant.

The Glossary of Gas Industry Terms, of which this is the third installment, will be continued at intervals and completed before the final chapter appears in the American Gas Fundamentals Series

Natural Gas Improves Product and Cost in the Brick Industry

by Christopher G. Hobson
The Peoples Natural Gas Co., Pittsburgh

NATURAL gas is playing a continually larger and therefore more important role in the manufacture of brick, as an increasing number of producers have selected it for their basic fuel.

Heating operations in brick production begin with drying to remove water from the moist molded shapes. After drying brick is burned: successively "water smoked," oxidized and vitrified. These three operations required have a high total gas consumption.

In preparing the clay, water must be added to permit shaping the brick. Drying wet brick presents a serious problem as this is the period when a major portion of the breakage takes place. On heavy pieces, slower drying usually is safer, but production rate and storage space are sacrificed.

Various types of dryers are used, but generally the results are the same. Temperatures are seldom above 450°F.

In tunnel dryers, special cars carry the brick through the length of the tunnel at a predetermined rate of speed. Tunnel dryers may be direct fired or they utilize waste or excess heat from other units. When waste heat is used, auxiliary direct fired unit is usually in standby. Forced draft moves moisture-laden air to flues or vents.

Kiln firing cycle

Brick firing, or burning may be either a batch or a continuous operation. In a batch kiln, brick is stacked on the floor and the openings are sealed. In the continuous or tunnel kiln, they are loaded on cars.

The firing of a brick kiln is in three distinct periods: water smoking, oxidation (carbon burning) and vitrification.

During water smoking, mechanical and hydroscopic water are driven off. The temperature must be raised slowly to approximately 1,000° F to prevent the moisture-laden air from softening the lower courses of brick and causing breakage. The moisture-laden air is driven from the kiln through the open flues, secondary air openings and observation ports.

In the oxidation or carbon burning period, batch kiln doors are closed and coated with mortar; observation ports are closed, and all other leaks sealed. This is done to build up the inside temperature and to give better control of the excess air. Excess air is desired, however, to permit oxidation and to carry heat to the lower courses of brick for more even distribution. The temperature during this stage is raised slowly to burn the carbon in the temperature range of 1200° to 1600°F.

From the end of the oxidation stage to the point where shrinkage begins, the temperature may be increased rapidly. The temperature and soaking time depend on the type of clay. In standard brick, the shrinkage desired is 1/16″ per 1″ and finished weight of approximately 5½ pounds. During the final stage, vitrification takes place, and this controls both hardness and color.

Coloring by flashing

Color is added to brick by a process known as flashing, during the vitrification period. The kiln atmosphere is changed from oxidizing to reducing which changes the resulting brick color. Further color changes are accomplished by deliberate addition of impurities while the atmosphere is reducing. The kiln is dampered and zinc, oil with salt, and even rubber may be introduced through charging ports near the burner nozzles causing a heavy penetrating atmosphere. Brick color varies with the type of impurity.

Kiln types

A typical round batch kiln is approximately 30′ in diameter, 13′ high overall with a 5′ crown from the spring line. Firing of this size and type of kiln is generally done in ten openings around the bottom, against a wall. Flames and products of combustion travel to the top of the kiln and down through the brick to flues in the floor and then to the stack. The wall may be of either dry or fireclay mortared brick, or checkered brick construction. This wall is used to prevent the flame from burning the brick and to guide the flow of hot gases from the firing chamber to top of kiln.

The bricks are set two to a course and the courses alternated at right angles, the space between bricks acting as flues. When coal is used as fuel, grate bars are installed in fireboxes and combustion is completed within the kiln. Upon conversion to gas or oil firing, firebox openings are closed except for those that suit burner equipment. Considerable latitude in selection of burner equipment is possible, but suitable combustion and distribution characteristics are required.

Flues in this type of kiln are usually of the spoke wheel type, in which collecting flues run to the center of the kiln and are there connected to an underground flue running to the main stack at one side of the kiln. Approximately 65,000 standard 8″ x 3¾″ x 2¼″ brick can be burned in this type of kiln at one time.

The rectangular kiln, in general, is fired in the same manner as the round type. This kiln is usually of a larger capacity, holding 100,000 or more standard bricks. The stacks in these kilns are arranged along the sides, separated by firing openings, with usually a double stack on each end. Firing with coal is in a semi-exterior firebox which is an extension of the firing chamber. When firing with gas or oil, the exterior firebox is either removed or closed off flush with the outside of the kiln and fired in the usual manner. Large doors are usually on either side of the end stack and are used for loading and unloading of the brick. An example of one of these kilns with 170,000 standard brick capacity has inside dimensions of 20′ x 67′ x 8′ to spring line of arch with 5′ 6″ rise to top of crown. The kiln has 20 stacks, 8 on each side with a double stack on each end. There are 28 firing ports, 14 on each side.

Tunnel kiln

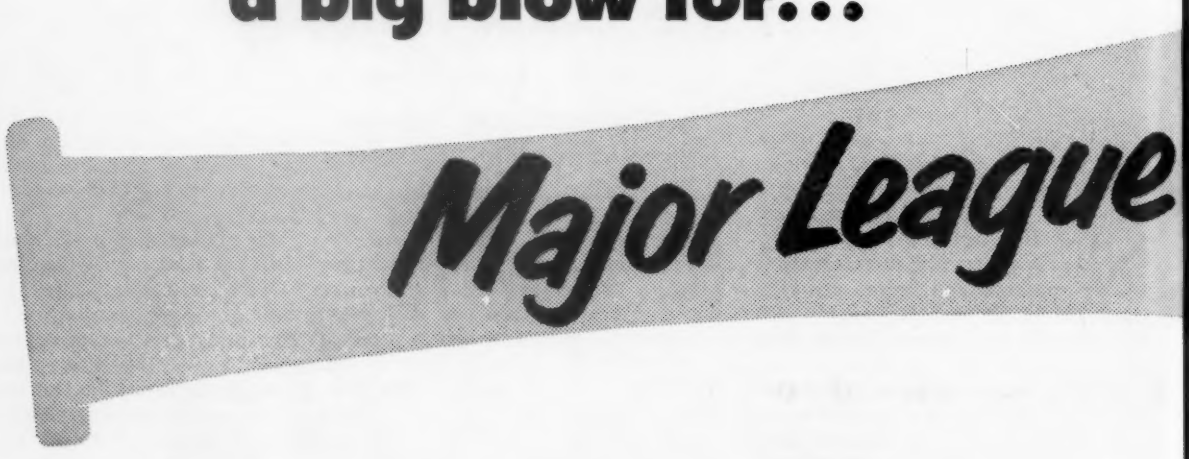
Tunnel kilns are of two types: muffle and the direct fired recirculating kilns. These are similar in most respects, except that in muffle kilns the products of combustion and flame never come in contact with the brick. This is prevented by a muffle or inner lining.

The muffle can be eliminated with gas firing.

In either type of kiln the excess heat is taken from the hot zone and circu-

(Continued on page 34)

Now Duo-Therm strikes a big blow for...



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Machine Combats Meter Problem In Natural Gas Conversion

(Continued from page 15)

from the degreaser through the still to keep the solvent in good condition. Roughly, 17 gallons of contaminants are drained from the still daily and the coils are removed for cleaning every 8 or 9 days.

As the concentrating chamber in the degreaser holds 1,250 gallons, a 1,500 gallon auxiliary storage tank was located adjacent to the degreaser so that the latter could be shut down periodically for cleaning. When the degreaser was given its first cleaning, after 42,000 meters had been processed, we salvaged almost 1,300 pounds of solder needles from the floor of the machine.

The aerator unit located adjacent to the degreaser is merely a mesh belt conveyor which carries degreased meters through a tunnel which has an exhaust system to remove any solvent vapors that have not evaporated in the degreaser. Meters are inspected at the unloading end of the aerator unit and the decision is made at that time to remove the diaphragms or reoil them.

In order to accomplish the reoiling of diaphragms with the greatest efficiency, a reoiling assembly was installed parallel to the aerator unit. It consists of an open steel tank 2 ft. wide and 30 ft. long which contains approximately 700 gallons of oil which is kept at 130° F by means of a gas-fired immersion coil. A monorail conveyor running above this tank permits meters to be immersed in the oil up to the level of the valve table. The product carrier designed for this job grasps the meter under the gallery so that there is only a negligible variation in the height of the valve table between a 5-lt. and a 10-lt. A bar across the path of travel causes the meters to tilt as they emerge from the oil thereby emptying any oil entrapped in the bottom of the meter. A mechanic then wipes the exterior and places the meter on a gravity conveyor which feeds the tinning line.

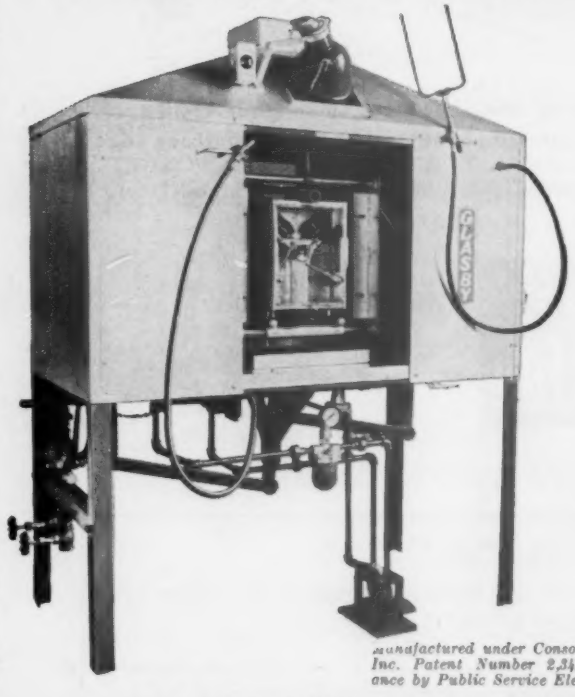
Light manpower requirements

The manpower requirements for the degreasing and reoiling operation are very light. The meters travel to the degreaser from the opening machines on a gravity conveyor. One man loads and unloads the degreaser and places the meters on the aerator unit. Another man, stationed at the opposite end of the aerator unit removes the meters, inspects them and either hands them off to be gutted or hangs them on the reoiling tank monorail. A third man removes the reoiled meters from the monorail, wipes them, and places them on a gravity conveyor which carries them to the tinners. The only other manpower requirement is the time of a mechanic for approximately an hour and a half each day to service the still.

The foreman who supervises the installation also is responsible for meter-opening operations, gutting the diaphragms from rejected meters, and operation of the machine which washes skeletons and small parts. He makes daily Ph tests of the solvent as an index as to whether or not the trichlorethylene is becoming acid. The average Ph tests show 6.0 and we have set an allowable limit of 5.5. He also takes a gravity test to determine the quantity of contaminants in the solvent.

Solvent usage on this system is in the order of about 12½ meters to a gallon of solvent. This is somewhat better than we experienced at the beginning but is capable of further improvement as we gain experience. As trichlorethylene in drum lots costs approximately 29% more than when purchased in bulk, we purchased an 8,000 gallon storage tank which we located adjacent to our rail-

Precision Meter Repairs with Maximum Efficiency



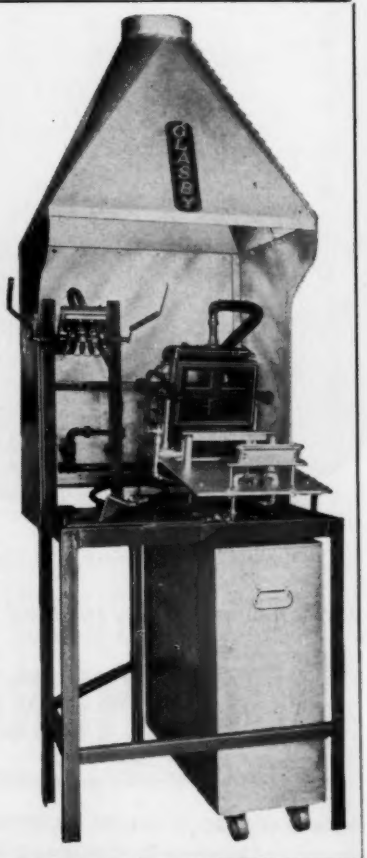
Minimum Repair Time Means Maximum Dollar Savings

← Meter Front and Back Removing Machine

This machine removes the front and back from gas meters in a fraction of the time previously required thus facilitating repair of diaphragms. Two models available—5 light meter and 10 light meter capacity. Both models are adjustable to most makes of meters and feature additional safety devices to protect the operator.

Meter Top and Valve Box Cover Removing Machine →

This machine facilitates the removal of meter tops and valve box covers to minimize the time-consuming problems of meter repair operation. Available in 5 light meter and 10 light meter sizes, both adjustable to most makes of meters. Both models feature devices for the safety of the operator.



manufactured under Consolidated Edison Company of New York, Inc. Patent Number 2,342,045. Application development assistance by Public Service Electric and Gas Company of New Jersey.

THE J. P. GLASBY MFG. CO. INC.

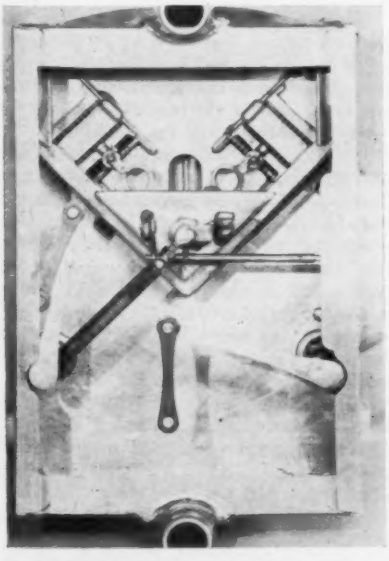
BELLEVILLE 9, NEW JERSEY — *Manufacturers of Glasby Conversion Burners and Furnaces*

road siding so that we could take shipments in tank car lots. Several hundred feet of 2" pipe carry the material from the storage tank to our building whence it is pumped as required to the fourth floor where the degreasing equipment is located.

Savings are substantial

As a result of our degreasing installation, diaphragm replacements have dropped to less than 25%. This is considerably less than we experienced in normal times with manufactured gas. The investment in the degreasing and reoiling equipment was rather high as there were so many side issues such as rigging, piping, wiring, and reinforcing a portion of the 4th floor to sustain the weight of the new equipment. However, with such an appreciable decrease in diaphragm replacements it is estimated that the savings during the first year of operation will be considerably in excess of the cost of the installation. The savings in manpower and space-requirements also are quite advantageous in our present circumstances.

The equipment has been in operation since December, 1952. Various minor refinements have been made in the operation since then and more will be forthcoming. As an example, when we first started operation, the valve covers were removed from every meter. As



Coil spring used to keep diaphragm ports in open position during drycleaning operation.

these covers had to be kept with the meter, considerable inconvenience in handling was involved. We found that the covers could be left in by wedging the valves in such a way that the two diaphragm ports would be open. A simple coil spring pulling the tangent bat toward the rear flag rod provided the answer to this problem.

We feel that the drycleaning process has been a major factor in helping us to combat the metering problems resulting from our transition to natural gas. After a few years of operation we expect to be able to abandon the process and begin to enjoy the more abundant life that some of the natural gas meter men have described to us in such glowing detail.

Calder Resigns as So Prod Pres

H. Gordon Calder, president of Southern Production Co., Inc., has announced his resignation as president, effective July 1. Mr. Calder will continue on the board of directors and as a consultant.

Arkansas Western Ups Rowden

Thad W. Rowden, Jr., has been made general sales manager for Arkansas Western Gas Co. and will head a reorganized sales department under which will come the sale of all domestic, commercial and industrial gas.

Mr. Rowden has served in various positions with the company for the past 20 years, having been employed as an installation engineer shortly after the company was formed. He is a member of Southern Gas Association's sales committee and gas code committee, and has been selected as general convention chairman for the year 1955.

A WIDER RANGE

... of Delivery Pressure Control

REYNOLDS HIGH PRESSURE LINE REGULATORS in parallel hookup have an increased range of capacity as well as a wider range of delivery pressure control. This also provides greater margin for emergencies. On inlet pressure the range is up to 650 pounds. For outlet pressure, this unit assures absolutely accurate and dependable control from 2 to 100 pounds. This variance in outlet pressure is made by use of different sizes of diaphram cases and further flexibility in the spring type is possible by use of different strength springs.

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Kansas City, Missouri

SEIDENGLANZ & CO.
2nd Unit, Santa Fe Building
Dallas, Texas

REPRESENTATIVES

EASTERN APPLIANCE COMPANY
Boston, Massachusetts

WALDO S. HULL
163 W. Queen Lane
Philadelphia, Pennsylvania

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.

GAS CONTROL SINCE 1892

News of the Gas Industry

AMERICAN METER CO OPENS NEW NEBRASKA METER PLANT

The formal opening was held recently of American Meter Company's new displacement meter plant, below, in Nebraska City, Neb. Part of a continuing expansion program, the new plants adds 48,000 square feet of space to the manufacturer's nationwide network of plants. Modern automatic machines and precision equipment utilizing advances in powdered metal technology have been installed.

1953-54 NOMINATIONS SUBMITTED BY AGA COMMITTEE

The general nominating committee of American Gas Association has drawn upon the executive talent of member companies throughout the United States and Canada for its slate of officers, directors and section chairman for the Association for submission at the AGA annual convention. Association officers, section chairmen and vice-chairmen will be elected for the 1953-1954 association year and directors will be elected for two-year terms expiring in 1955. Nominees include executives of manufactured, natural and mixed gas companies as well as pipeline and utility holding companies. Manufacturers of gas appliances and equipment are included in the list of candidates.

Nominees will be voted upon by the membership at the 1953 AGA annual convention, St. Louis, October 26-28. The general nominating committee presenting the slate was elected at the 1952 convention. It comprises: F. A. Lydecker, Public Service Electric & Gas Co., chairman; James S. Moulton, Pacific Gas & Electric Co.; Robert E. Ramsay, New Haven Gas Light Co.; Willard F. Rockwell, Jr., Rockwell Manufacturing Co.; Harry K. Wrench, Minneapolis Gas Co.; C. H. Zachry, Southern Union Gas Co., and H. Carl Wolf, AGA, secretary.

Offices to be filled include those of president, two vice-presidents, a treasurer, 15 directors and 11 section and vice-chairmen.

Nominations for Officers

President: Earl H. Eacker, president, Boston Consolidated Gas Co.

First vice president: F. M. Banks, president and general manager, Southern California Gas Co.

Second vice president: Dean H. Mitchell, president, Northern Indiana Public Service Co.

Treasurer: Vincent T. Miles, treasurer, Long Island Lighting Co.

Nominations for Directors

M. A. Abernathy, vice president, United Gas Pipeline Co.

B. C. Adams, president, Gas Service Co.

L. L. Baxter, president, Arkansas Western Gas Co.

Frank Austin Brownie, president, The Canadian Western Natural Gas Co., Ltd.

Sheldon Coleman, president, The Coleman Co., Inc.

H. C. Cummins, first vice president, Northern States Power Co.

J. F. Donnelly, vice president in charge of sales, Servel, Inc.

John E. Heyke, Jr., vice president, The Brooklyn Union Gas Co.

J. K. Horton, president, Pacific Public Service Co.

D. E. Karn, president, Consumers Power Co.

W. H. Ligon, president, Nashville Gas Co.

A. W. Lundstrum, president, Ohio Fuel Gas Co.

F. T. Parks, vice president in charge of operations, Public Service Co. of Colorado.

L. B. Richards, vice president, Harrisburg Gas Division, The United Gas Improvement Co.

J. Theodore Wolfe, executive vice president, Consolidated Gas Electric Light and Power Co.

Nominations for Section Chairmen

Accounting: Paul E. Ewers, commercial office manager, Michigan Consolidated Gas Co.

Industrial and Commercial: Charles C. Eeles, district industrial sales manager, The Ohio Fuel Gas Co.

Operating: Frederick J. Pfluke, superintendent of gas operations, Rochester Gas & Electric Corp.

Residential: Raymond Little, general sales manager, Equitable Gas Co.

General Management: Lovett C. Peters, financial vice president, Laclede Gas Co.

NYPSC OKAYS ADJUSTING RATE BASED ON PRICE TO UTILITY

The New York Public Service Commission approved, early in July, a proposal that gas rates of four City of New York utility companies be subject to an adjustment which takes into account the price of natural gas, received from transmission lines, over the base cost. The utility companies affected by the new ruling are: Brooklyn Union Gas Co., Consolidated Edison Co., Brooklyn Borough and Kings County Lighting Companies.

Any fluctuation in the cost of natural gas to the utility, either upward or downward, will be taken care of by the new ruling. When the price is lower than the base cost of gas the decrease will be forwarded, through a rate adjustment, to the customer.

In passing on the proposal, NYPSC concluded that the new method eliminates the necessity for protracted proceedings every time the wholesale price is changed.

The rate adjustments which went into effect in July were monthly increases for kitchen use of from less than 3.5 cents in apartment houses to less than 7 cents in one family houses. Commercial and industrial customers of the utilities received the same increase per Mcf as residential customers.

Brooklyn Union Co. also has received approval for a decrease of 4 cents per Mcf for residential house heating. This decrease is expected to offset most of the present increase granted by NYPSC under the purchased-gas rate adjustment plan.

Gas Sales Gain in May

Sales of the gas utility industry to ultimate customers during May, 1953, totaled 4,286 million therms, a gain of 16.5% over sales in the same month a year ago, American Gas Association reports.

For the twelve months ended May 31, 1953, utility gas sales totaled 54,375 million therms, an increase of 8.8% over therms sold in the previous cumulative period.

Natural gas utility sales in May totaled 4,017 million therms, an increase of 17.6% over sales in May, 1952. For twelve months ended May 31, 1953, sales of natural gas amounted to 51,122 million therms, a gain of 9.8% over sales in the previous twelve-month period.

Manufactured and mixed gas sales in May totaled 269 million therms, a gain of 2.2% over a year earlier. For the twelve months ended May 31, 1953, manufactured and mixed gas sales were 3,254 million therms, down 4.9% under the previous comparable period.

Canadian Assn Elects Officers

At its recent annual meeting in Montreal, Canadian Gas Association elected officers for the 1953-1954 association year. D. K. Yorath, general manager, Northwestern Utilities Ltd., Edmonton, Alta., was elected president; S. B. Severson, chairman of the board, Dominion Natural Gas Co., Ltd., Buffalo, N. Y., first vice president; P. W. Geldard, engineer of distribution, Consumers' Gas Co., Toronto, Ont., second vice president; and W. A. Higgins, Toronto, Ont., was elected executive secretary and treasurer.

Illinois Processing Plant Starts

The first step in the completion of National Petro-Chemicals' $44 million project at Tuscola, Ill., was taken this week when the hydrocarbon extraction and fractionation units of the plant began processing natural gas from Panhandle Eastern Pipe Line.

These units are said to comprise the largest plant in the world for the recovery of hydrocarbons from natural gas. When operating at full capacity, the plant will process 400 MMcf per day and will have a daily output of 450 thousand gallons of natural gas liquids. In addition, 10 million cubic feet per day of ethane will be recovered from the natural gas for conversion into ethylene, the raw material for chemical units scheduled to go into production later this year. The initial chemical production will consist of 40 million gallons per year of synthetic ethyl alcohol and 50 million pounds per year of ethyl chloride. This will be followed by production of polyethylene, early in 1955.

National Petro-Chemicals Corporation is a joint venture of National Distillers Products Corporation (60%) in partnership with Panhandle Eastern Pipe Line Company (40%).

Phila Office for Ipsen Industries

Ipsen Industries, Inc., Rockford, Ill., has announced the opening of a new sales and service division in Philadelphia. The branch office and warehouse is the new headquarters of Alfred E. Stone, sales engineer. Also attached to the office will be John Keegan, service engineer, and Margaret Schramm, manager.

California Facilities in Big Expansion

In receipt of final approval by state and federal regulatory bodies of a joint-$210,000,000 project to bring additional mid-continent gas into California, Southern California Gas Co., Southern Counties Gas Co., Pacific Gas and Electric Co. and El Paso Natural Gas Co., are rushing completion of new pipelines and compressor stations to take delivery of the new gas by January 1, 1954.

The project will provide 150 MMcf more natural gas for the southern companies' customers and a like amount for customers of P.G.&E., in northern California. Upon its completion, the El Paso company will be furnishing a total of 1,400 MMcf a day to California markets. Deliveries to the Southern companies will total 705 MMcf a day by the end of 1954.

Cost of new facilities will total $175,000,000 for El Paso, $7,500,000 for the two Southern California companies, and $26,700,000 for P.G.&E. El Paso is adding 1,056 miles of pipe and 162,000 horsepower in compressor stations to its system in Texas, New Mexico, Arizona and Colorado. The Southern companies are laying 73 miles of 30" pipeline, adding 5,280 horsepower at one station and building two new stations. P.G.&E. is installing 227 miles of pipeline and adding 15,000 horsepower.

The total investment of all gas companies involved in the Texas-California pipeline project will exceed $500,000,000 by the end of 1954.

Dig 'em and fill 'em with CLEVELANDS

The Cleveland "Baby Digger" Model 95 is making short work of cutting trench for a gas main extension under good digging conditions in Minneapolis. Even greater savings were effected by the 95 during severe winter digging conditions.

Here, a Cleveland Model 80 is speedily and cleanly backfilling the trench shown in the top picture. The 80 is also an excellent pipe layer. When job conditions require backfill compaction, the 80 does an outstanding job with no additional men or equipment necessary.

The CLEVELAND TRENCHER CO.
Pioneer of the Modern Trencher
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

Natural Gas Improves Product and Cost in Brick Industry

(Continued from page 27)

lated to the cooler zone for counterflow heat transfer to incoming brick. Conversion of this kiln from coal to gas is accomplished in the same way as in batch kilns. However, with coal firing, the installation usually is stoker-fired.

Although waste-heat recovery makes the continuous kiln 40-to-55% more efficient, it lacks flexibility. Continual operation requires a stepped-up production line to insure enough brick for 24-hour operation of the kiln.

In the choice of gas burners, there is a wide variation from one kiln to another. The range runs from a piece of pipe to well-designed, automatically controlled equipment. While the end-product is often the same, better burners result in less trouble and require less operating experience. The chief burner of a brick plant can make good brick with either type of equipment, if he is experienced and has the necessary knowledge to draw upon, but with good burners he can more easily maintain a predetermined time-temperature schedule and secure more uniform results.

GAS REQUIREMENTS IN BRICK MANUFACTURE

Based on 1,000 Btu Natural Gas

FACE BRICK

Operation	*Mcf per 1,000 brick*
Drying, periodic kilns	2
Burning, periodic kilns	11
Total, periodic kilns	13
Total, tunnel kilns	7

REFRACTORY, BUFF OR WHITE-FACED BRICK

Operation	*Mcf per 1,000 brick*
Drying, periodic kilns	3
Burning, periodic kilns	15.5
Total, periodic kilns	18.5
Total, tunnel kilns	8.5

Fuel comparison

When gas is compared with oil or coal as a kiln fuel, major factors of consideration include: (1) product quality, (2) production rate and (3) product unit cost.

Certain definite and important product improvements result from the use of gas.

At a Pittsburgh-area brick plant which changed to gas, the increased value of brick per kiln has been estimated to be more than $200 in the competitive market. The number of chimney brick and bats (broken brick) have decreased to about half; more desirable dark and medium colored bricks have increased. Shades are more easily matched because colors run more true, and consequently a saving of $50 per kiln load has been estimated on labor cost of sorting. Every brick is now of excellent color and hardness. Discoloration from fuel-borne sulfur is eliminated.

When the same brick plant was firing with coal, a 170,000-brick kiln load required a 180-hour firing cycle. During a year's operations with gas, 160 cycles in this case, cycle-time was reduced to an average of 144 hours. This time saving has resulted in a production increase during firing of 25%. Recent reconstruction and insulation of two rectangular kilns has further reduced the cycle to 134 hours.

Conversion from coal to gas necessitates changes in firing schedule. With coal hand firing, the temperature drops after each charging; with gas the temperature does not dip but makes a steady uniform rise. Gas firing permits the use of a predetermined schedule, such as 25°F rise per hour, and this can be controlled by a simple gas valve.

Fuel costs

Fuel cost comparisons in any heating operation require the addition to invoice fuel cost of all hidden charges before development of true costs "as fired." To these figures must be added all credits which result from the use of gas.

Labor savings. If conversion is from coal, the fireman is either eliminated or released for other duties. The man who formerly repaired fireboxes, grate bars and bag walls is also released.

Materials savings. As labor is saved, there usually is a comparable saving in tools and materials used by laborers.

Reduced maintenance. This accrues directly from increased kiln life which has been shown to result from gas firing.

Elimination of ash handling. Whether this item should be included in fuel cost "at the burner" is a matter of interpretation; it should not be overlooked.

Improvement in working conditions and public relations. In terms of dollars, gas firing should be credited with what it would have cost to effect comparable improvement with other fuels. Public relations are influenced by the soot content of chimney gases from the plant. Labor conditions are improved by elimination of fly ash and the greater ease with which bricks are removed after firing.

Most brick manufacturers will agree that gas is the ideal fuel for their use; fewer of them, however, realize that they can afford to use it. Where bricks are made near the natural gas fields, gas is almost always chosen. Consideration of all factors will justify natural gas firing in many other sections of North America. The Pittsburgh-area plant, described earlier, finds it practical to burn gas even though ample coal *is located on company property!*

Adapted from an
Information Letter
Industrial and Commercial Gas Section
American Gas Association

Gas Companies, GAMA and Public Opinion Kill Kent Coal Grab Bill

(Continued from page 16)

Government Committee, whose chairman, G. Graybill Diehm, was opposed to its passage. The committee voted overwhelmingly against reporting it to the floor and the Kent bill became a dead issue for the 1953 session.

Prophetic were the words expressed in the widely quoted AMERICAN GAS JOURNAL editorial, which said ". . . the proposed Pennsylvania legislation may, and in all probability will become a model after which the coal interests in West Virginia, Ohio and Kentucky will pattern similar proposals to their several legislatures." During the final stages of consideration of the Kent bill, an even more drastic measure, the Collins bill, was introduced into the Ohio legislature. Its provisions were so extreme, however, that the Ohio Senate Agriculture and Conservation Committee to which it had been referred, was deluged by a mass protest from newspapers, city officials, utility commissioners and manufacturers from all sections of the state. As a result it was killed in committee.

Gas utility men in the states of Pennsylvania, Ohio and West Virginia are of the opinion that they have not seen the end of attempts by the coal industry to pass hampering legislation. But they are now confident that their new found solidarity and technique in presenting matters of public interest and concern to the citizens will enable them to again enlist the necessary public support whenever such support is necessary.

AmerNatGas Contracts for Reserves

American Natural Gas Co. has announced that contracts for large reserves of natural gas in the Gulf Coast area of Louisiana have been signed with Stanolind Oil & Gas Co. and with The Superior Oil Co.

Application will be made promptly to Federal Power Commission for authority to build a 30-inch pipline to transport this gas from Louisiana to American Natural's markets, comprised chiefly of two system distribution companies, Michigan Consolidated Gas Co. and Milwaukee Gas Light Co. Also included are 14 other utility companies serving communities in Michigan and Wisconsin.

Weigele Retires from Mich Cons Gas

Theodore W. Weigele, vice president and engineer of Michigan Consolidated Gas Co. and its affiliate, American Natural Gas Service Co. retired July 1, after 39 years of service with the company.

Mr. Weigele began working for American Light and Traction Co., predecessor of American Natural Gas Co., in 1914. In May 1936 he was made househeating engineer to study the spaceheating load, and developed the engineering formulas for design and sizing of spaceheating installations. He prepared the engineering and economic studies in connection with the use and purchase of the company's Austin storage field, in 1938.

He has been Michigan Consolidated's gas engineer since 1944, was made a vice president in 1948 and vice president-engineer of American Natural Gas Service Co. in 1950.

Gas Dries Paint on California Chryslers

Chrysler Corporation recently produced its millionth California-made car, and natural gas came in for its share of the plaudits at the celebration honoring the milestone.

Besides heating the plant and taking part in many small operations, natural gas also dried the paint jobs on each and every one of the million cars.

The millionth car was driven off the assembly line by John P. Mansfield, president of the Plymouth division and vice president of Chrysler Corporation.

Mr. Mansfield was chief speaker at the occasion attended by over 500 industrialists.

Smith Retires from So Jersey Gas

Earl Smith of South Jersey Gas Co. has announced his retirement as president. He will remain as a member of the board of directors. Mr. Smith is succeeded as president by Theodore H. Kendall, formerly executive vice president, who was elected by the board of directors. Also, it was announced that Albert W. Conover, of Pittsburgh, has been elected chairman of the board of directors.

Mr. Smith began his career in the gas industry in 1911 at Lansing, Mich. He was elected president of South Jersey Gas Co. in 1948. He is a director of American Gas Association, a director of New Jersey Gas Association and vice president of New Jersey Utilities Association.

Mr. Kendall has served as executive vice president and a member of the board of directors of the company since October, 1952. Prior to that time he was associated with the Equitable Gas Co., Pittsburgh, for more than 28 years.

Mr. Conover has served as a member of the board of directors of the company since 1950. He is president of the Equitable Gas System, and president of Kentucky West Virginia Gas Co. He is also chairman of the executive committee of the North Shore Gas Co.

Pacific Products Appoints Rep

Pacific International Products, Inc., San Marino, Cal., has appointed Theger Co., Houston, Tex., as representative of the company in Texas, Oklahoma, Louisiana, Arkansas, Mississippi, and Tennessee.

PROOF

HERE'S HOW TAPECOAT® HAS STOOD THE TEST OF TIME TO SOLVE CORROSION PROBLEMS

PROOF (Underground) — Inspection of TAPECOATED joints after 10 years of underground service showed no sign of corrosion when the TAPECOAT was removed.

PROOF (Alternate wetting and drying) — Expense and trouble in protecting lines subject to wet and dry conditions at cooling towers have been eliminated since 1944 by coating with TAPECOAT.

PROOF (Underwater)—During the re-laying of an underwater pipe line in the Gulf area, examination showed that TAPECOAT had protected the pipe against salt water corrosion and barnacles.

PROOF (Above ground)—A gas line at a bridge crossing was TAPECOAT-protected in 1944. There has been no need for attention and *no interruption of service* since the pipe was TAPECOATED.

Actual experiences like these show what TAPECOAT coal tar protection can do for you.

Use TAPECOAT to combat corrosion above or below ground on gathering lines, transmission lines, meter stations, compressor stations, distribution lines, pipe joints, bolt-type couplings, fittings, large bends, large diameter pipe, insulated lines, tanks, and other surfaces subject to corrosion.

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The* TAPECOAT *Company

Originators of Coal Tar Tape Protection

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MAIN
TREATMENT
SERVICE

Prepare for Natural Gas

GPM PRODUCTS

"FLUSHALL"
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"SOLVALL"
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"SEALALL"
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"FOGALL H"
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"RUBBER CONDITIONER"
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Rubber Gaskets
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Discuss your problems with our engineers

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MEN AT WORK

Hulswit Is Rockland L&P Co Pres

Charles L. Hulswit has been elected president of Rockland Light & Power Co., Nyack, N. Y., and its subsidiaries, succeeding the late Fremont L. Lovett. At the same time Mr. Hulswit was elected a director of the two subsidiaries, Rockland Electric Co. and Pike County Light and Power Co.

Charles L. Hulswit

Previously a vice president and director of the parent company and vice president of the two subsidiary companies, he joined Rockland Light & Power in December, 1952, when that company acquired Rockland Gas Co. of which he was president.

At the time of the purchase, Mr. Hulswit had been president of Rockland Gas for fifteen years and, under his management, it had expanded from 1,800 customers to 14,000 customers.

Exec Promotions at Pacific G&E Co

A series of top management changes and executive promotions have been announced by Pacific Gas and Electric Co.

Dunlap D. Smalley, vice president in charge of operations since 1947, has been advanced to vice president and assistant general manager.

George H. Hagar has been appointed vice president in charge of operations to succeed Mr. Smalley.

Arthur J. Swank, manager of general construction since 1951, has become vice president in charge of general construction, a new office.

Another new office is now held by Robert H. Gerdes as vice president and general counsel.

Osborne is Div Mgr of Koppers

T. M. Osborne has been appointed manager of the newly-combined chemical and gas department, engineering and construction division, Koppers Co., Inc. Prior to this appointment he served as manager of the chemical department when it functioned as a separate unit.

Serving as assistant manager of the new department is Dr. A. J. Abrams, formerly assistant manager of the chemical department. Also, named as sales manager of the department is J. H. Tassig, Jr.

Mr. Osborne joined the company in 1947 as assistant manager of the control section of the engineering and construction division.

Mr. Abrams joined Koppers research department as a chemical consultant in 1946.

Woodhead Retires from Pittsfield Co

Frank A. Woodhead, vice president and general manager of Pittsfield Coal Gas Co. retired on June 30. J. T. Kelley, formerly associated with Stone & Webster Service Corp., has been elected vice president and general manager to succeed Mr. Woodhead.

Pacific Gas & Elec Promotes 4

Promotions for four operating department executives in the San Francisco general office, Pacific Gas and Electric Co., were announced by the company recently.

Ira W. Collins, general superintendent of power control, has been appointed assistant to the new vice president in charge of operations, George H. Hagar.

Jack H. Martin has been named general superintendent of power control. Robert H. Miller, now general superintendent of communications, was promoted to assistant general superintendent of power control, and Robert L. Brinton succeeds Mr. Miller in charge of radio and telephone communications.

Columbia System Ups 3 in Pbgh

James E. Coleman and Dan J. Egan have been elected vice presidents, and Donald H. Melaney an assistant secretary, in the Pittsburgh group companies, Columbia Gas System.

Mr. Coleman and Mr. Egan, both veterans of over 25 years in the utility business, were advanced from the position of assistant vice presidents. Mr. Melaney has been a member of the legal staff.

Eclipse Appoints Southern Rep

General Combustion Co. is the new district representative of Eclipse Fuel Engineering Co., covering the states of Alabama and Northwestern Florida. Frank Matzek and Charles Herron, of General Combustion, 339 Brown Marx Building, Birmingham 3, Ala., will handle sales and service for the complete line.

STANDBY
for
NATURAL GAS

A packaged propane plant as designed, engineered and built by Draketown will provide a completely interchangeable fuel for your natural gas.

Ready in a matter of minutes, your Draketown Plant will click on automatically and take over all or part of your gas load. No delay—no appliance adjustments—no personnel problem.

During gas curtailment periods, "turn on" your Draketown Plant—you will find it pays dividends—it's good "Gas Insurance"!

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*100% TOWN or PLANT SUPPLY

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Semet-Solvay Appoints Research Dir

Semet-Solvay division, Allied Chemical & Dye Corp., have announced the appointment of Dr. Lawrence D. Schmidt as director of research for Semet-Solvay and Wilputte Coke Oven divisions.

With the U. S. Bureau of Mines for 18 years and head of the Bureau's Morgantown Experiment Station since 1946, Dr. Schmidt has pioneered in the development of new processes for the gasification of coal.

Orr & Sembower Name Boston Rep

Orr & Sembower, Inc., has announced the appointment of C. A. Breed, Inc., West Newton, Mass., as sales and service representative handling Powermaster packaged automatic boilers in the Boston area.

Also, the company has reported the opening of a New York office at 51 E. 42 St.

SCOTT R. BABCOCK has been named service engineer, Rockford, Wheelco Instruments div., *Barber-Colman Co.*

JACKSON M. BARTON is now exploration manager, gas supply department, *Northern Natural Gas Co.*

LEONARD V. BLOOM has been added as service engineer, Detroit, Wheelco Instruments div., *Barber-Colman Co.*

C. L. COLEMAN has been named sales representative, California, Arizona, Colorado and New Mexico, *The Sprague Meter Co.*

W. O. COOK is now vice president, Ideco division, *Dresser Industries, Inc.*

1897 1953

GOODMAN USED SINCE 1897 — 2" HANDLE & LOCKING SLEEVE — GAS MAIN STOPPER

PIPE STOPPERS OF ALL KINDS

•

SAFETY GAS MAIN STOPPER COMPANY

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Brooklyn 17, N. Y.
Cable Address: GASTOPPER, N. Y.

THOMAS DEBEVOISE was appointed supervisor of inventory control, *Peoples Natural Gas Co.*

HAROLD L. DIRKERS is now sales engineer, Detroit, Wheelco Instruments div., *Barber-Colman Co.*

JACK R. FRASER has been appointed chief petroleum engineer, *Texas Eastern Production Corp.*

A. B. GATES, JR., has been appointed assistant controller, accounting department, *Southern California Gas Co.*

W. T. GETTIG has been named general manager, Barberton, *Rockwell Manufacturing Co.*

H. H. GORRIE has been appointed chief engineer, in charge of engineering activities, *Bailey Meter Co.*

H. C. HAMMOND has been named manager, accounting department, *Southern California Gas Co.*

ROBERT HEMMAN is now sales engineer, Boston, Wheelco Instruments div., *Barber-Colman Co.*

LAWRENCE S. HOLBROOK has been named service engineer, Boston, Wheelco Instruments div., *Barber-Colman Co.*

SAMUEL A. HORSFIELD has been elected assistant vice president, in charge of gas operations, *Long Island Lighting Co.*

WILLIAM E. KING has been named service engineer, New York, Wheelco Instruments div., *Barber-Colman Co.*

RICHARD H. LAMBERTON has been named midwest manager, plate and welding div., *General American Transportation Corp.*

RALPH R. NEWQUIST has been named president and general manager, Roots-Connersville Blower division, *Dresser Industries, Inc.*

GEORGE H. R. O'DONNELL, JR., has been appointed sales representative, East coast to Virginia, Pennsylvania and New York, *The Sprague Meter Co.*

CLYDE PERSON has been named service engineer, Rockford, Wheelco Instruments div., *Barber-Colman Co.*

KARL SCHICK has been promoted to sales manager, Original Equipment division, *Minneapolis-Honeywell Regulator Co.*

WORTHY K. SCOTT, JR., has been named rate engineer for *New York State Natural Gas Corp.*

FRANK E. SEERY is now district sales manager, Plate and Welding division, *General American Transportation Corp.*

TODD W. SMITH has been assigned as sales and engineering representative, Seattle office, *The Cooper-Bessemer Corp.*

FLOYD V. SNODGRASS has been appointed to a special representative post involving supervision of production & operations, Oakland and Sulphur Springs, *Rockwell Manufacturing Co.*

E. M. TOUSSAINT has been named general manager, Appliance Controls division, *Minneapolis-Honeywell Regulator Co.*

ROBER UNGER is now service engineer, Chicago, Wheelco Instruments div., *Barber-Colman Co.*

E. K. WILKINS is now general construction manager, *Ebasco Services, Inc.*

W. D. WILLES has been appointed general manager, Nordstrom Valve division, Oakland, *Rockwell Manufacturing Co.*

BAMAG

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has supplied hundreds of installations for the gas industry all over the world

Consult GIDCO for BAMAG's processes and equipment:

- New improved Alkacid plants for recovery of hydrogen sulfide and carbon dioxide from industrial and natural gases
- New improved Claus plants for recovery of elemental sulfur
- Winkler and other types of generators for gas generation from coal
- Special Bamag tubular gas coolers
- Hydrogen sulfide scrubbing with active carbon
- Main equipment and accessories for gas utility companies
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NEW EQUIPMENT

Service cock

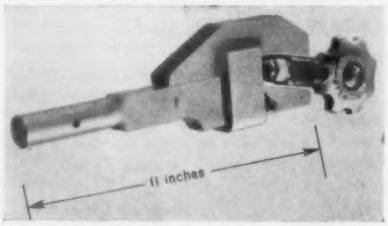
This lubricated, tamperproof service cock is available in sizes of ¾" through 1½". To resist tampering the manufacturer

states a screw driven in the stop collar prevents removal of the collar, and a blind drive pin in the adjustment collar holds that collar fast. Grooves above and below the plug ports carry a film of lubricant to all areas of the seating surface providing a positive seal whether the service cock is open or closed, it is reported. Additional insurance against leakage is also provided by rings at the upper and lower ends of the plug. The service cock is rated at a working pressure of 125 psig, water, oil or gas.

Nordstrom Tamperproof Service Cock. Rockwell Manufacturing Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

Adjustable valving wrench

Designed specifically for insertion of valves in cylinders this adjustable valving wrench can be used by one man for inserting or removing high pressure cylinder valves, or bottled gas valves from cylinders. It is made of steel alloy case hardened to insure long life the manufacturer reports. The handle can be fitted with either of two jaws; one adjustable from 15/16" to 1



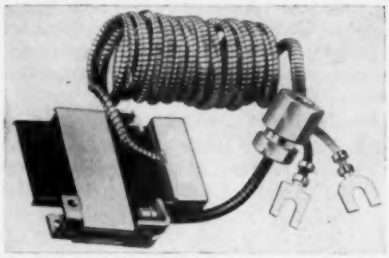
3/16"; the other from 1 3/16" to 1 7/16". It is necessary to attach a 1" steel pipe extension to the wrench, the length of the extension governing the amount of torque applied.

Valving Wrench. Superior Valve & Fittings Co., Pittsburgh, Pa.

Gas burner control system

A self-powered control system for gas burners, featuring a new powerpile with a blue flame pilot that uses no primary air and eliminates the problem of clogging, has been announced by the manufacturer. No larger than a matchbook, the pilot is described as the first completely lint-free pilot in the gas heating industry, and a new concept in pilot burner design that achieves complete combustion at the point of flame. The company reports that no air from the atmosphere is brought into the gas stream before it is burned, and combustion is quiet under a wide range of gas pressures. The pilot, it is said, burns less gas than the conventional single couple type, and generates about 40% more electrical power than contemporary multiple couple pilots. The

amount ranges from 500 to 800 millivolts. The inlet connection may be swiveled through 360 degrees or formed as required to route the pilot gas line in desired direc-



tion. There is one orifice for natural, mixed and manufactured gases, and an available interchangeable orifice for LP gas. With

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the pilot, the company has developed a new powerpile diaphragm valve reportedly requiring less space for mounting than the conventional solenoid. The valve has a pressure rating of eight ounces and is suitable for use with all gases. The valve actuator features a polarized relay.

Blue Flame Pilot. Minneapolis-Honeywell Regulator Co., Philadelphia 44.

Runabout ditcher

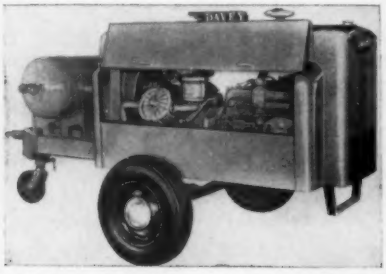
This wheel mounted ditcher features fluid coupling and curved-tooth bucket line. With the fluid coupling, the manufacturer

states, underground obstructions pose less of a problem since, if the obstruction presents too much resistance to the bucket line, the coupling slips and the bucket line stops. This is said to provide overload protection with no possibility of damage to the machine. The machines hydra-crowd transmission provides a range of forward speeds from zero to 16 fpm. A new design in the hydraulic drive mechanism is a counterbalance valve said to provide elimination of run-away tendency when the machine is digging on a down-grade. The curved digging teeth reportedly have increased the digging efficiency through longer tooth life. Both ends of the tooth are identical in shape and when one end is worn, a retaining pin is knocked out, the tooth reversed and the pin replaced.

Model 705-B. Barber-Greene Co., 400 North Highland Ave., Aurora, Ill.

Compressor

A new 210 cfm compressor of two-wheel trailer design, the unit is said to be very light and compact. It is 145" long, 62" high



and 75" wide, and weighs 3,400 lbs. It is equipped with newly-developed multi-port valves which reportedly increase by 15 to 25% the amount of air delivered per pound of fuel. The engine is of six cylinder design with a power surlpus of over 25%. The manufacturer states the valves will never carbon or foul and will operate at peak efficiency during the life of the compressor.

Super Chief Model 210-WDS. Davey Compressor Co., Kent, O.

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THE WAY most gas appliances have been sold during the past six years shows a substantial margin over the competition, in the figures accumulated by Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association. Gas ranges totaling 14,853,100 and 8,156,000 electric ranges were sold in that period. Also, 12,066,800 gas water heaters and 5,390,000 electric storage water heaters. Gas floor and wall furnaces accounted for 2,844,200 units while the oil total was 498,900. Direct heating units were divided: 11,790,200 for gas, 9,284,100 for liquid fuels and 6,274,200 for coal and wood.

WITHOUT adequate consumer credit, our industries could not produce in the same volume, sell at the same prices nor maintain the present high degree of research and product development. That is the opinion expressed by Sheldon Coleman, president-elect of GAMA, in a criticism of economists who regard consumer debt as having reached a dangerous level. "They lose sight of the fact that mass financing is as essential to our system as mass production and mass distribution," he said. $20-billion was the amount of installment credit in the past year, he pointed out. Industry and government should promote the intelligent use of credit facilities to speed the movement of goods, Mr. Coleman said, and noted that "there will always be a need for safeguards against loose credit." He said that the ratio of consumer credit to disposable income invariably adjusts itself in the normal course of business and that it is lower now than in 1941. The annual saving rate for 1952 was $20-billion, he said, which was three times the 1949-total and nearly eight times the 1939 figure.

A SPECIAL features chart of current gas ranges has been prepared for utilities and, presumably, their dealers by American Gas Association. The chart analyzes the models of 35 gas range manufacturers for their features, grouped under 8 major classifications. Separately, range trade-names are related to their manufacturers. The purpose of the chart is to facilitate determining which manufacturers make ranges with specific operational or convenience features.

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NEW BULLETINS

BURLING TEMPERATURE CONTROLS. Included in this bulletin is a general description of all of the company's electric temperature controls, pictures of all models including new models A-1S and B-1C, and a separate description of pneumatic and valve type controls. Also, there is a comprehensive selection and comparison table showing the essential features of each of the 17 electrically operated temperature controls. Included are the one, two, and three switch models, some of which are suitable for 1800° F.

Bulletin G-18. Pp. 4. Burling Instrument Co., 5 Vose Ave., South Orange, N. J.

I-R COMPRESSORS FOR LIQUEFIED GAS TRANSFER. This new bulletin describes the company's compressors for the transfer of liquefied gas such as LPG and anhydrous ammonia. The two-color bulletin shows the construction of the unit by means of a sectional view. All important operational and construction features are fully captioned. One page is devoted to a typical installation problem, showing a view of an unloading plant with the four major steps of the unloading cycle worked pictorially.

Bulletin 1052-A. Ingersoll-Rand, 11 Broadway, N. Y. 4, N. Y.

ELECTROMAX TEMPERATURE AND CONDUCTIVITY CONTROLLERS. Complete data about electronic instruments for two-position or proportional control is presented in this illustrated bulletin. It shows how three types of temperature controllers are being used to regulate temperatures up to 1,000° F, and describes a conductivity controller that is being used to check condensate purity. One section of the bulletin combines diagrams and descriptions to show how the temperature controllers apply two-position control or proportional control. Included are pictures of typical installations. Specifications are listed in easy-to-read tables.

Bulletin ND47. Pp. 20. Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44.

SURE-GAS LPG STEAM VAPORIZERS. The vaporizer described in this bulletin has been designed for use in industrial plants and utilities using LP gas for standby, peak shaving, or continuous service. Included in the bulletin are specifications, installation data, model numbers with capacities, and a drawing showing the unit's construction.

Bulletin 8-52. Pp. 4. Roth Manufacturing Co., P.O. Box 2358, Tulsa, Okla.

Bond Market Recovering from Jitters

(Continued from page 21)

increase in individual 'take home pay' will mean just so much more available for investment in equities. And stimulus to corporate earnings will be direct in the event the ending of EPT is followed subsequently by increase in depreciation allowances and by some relief from the burdensome double taxation on dividends.

But while admitting the improvement in basic factors which influence the market for equity stocks, some leading investment people favor a cautious attitude toward utility common stocks. The reasoning behind this might best be expressed in the words of one of the leading New York investment firms which recently stated that: "The sharp rise in interest rates since the first of the year contributed importantly to the decline in utility stocks and there remains some question as to whether the reversal of the Government's easy money policy will necessitate a change in the basic relationship between price, earnings and dividends, which was established during a period of low money rates. We believe, however, that the prospects for a reduction in financing requirements, which have tended to depress utility stocks during the past six years, should be sufficient to offset a generally higher level of interest rates. We do feel, however, that there will be a normal contraction of institutional buying of utilities following the heavy demand of the past two years and that, almost regardless of price, many of these investors will use their funds to build up other sections of their portfolios.

"Recent recovery in price appears due, largely, to a combination of speculative buying and a cessation of new offerings. We advise deferring additional purchases until there are some indications that the higher prices represent something more than a technical and temporary recovery. While earnings and dividends will probably continue to improve so long as the present high level of business activity is maintained, we believe that there might be a sharp reversal in earnings in the event of a decline in business activity. This contingency, over which there is wide disagreement among leading businessmen and economists, is not reflected in the present level of prices and, in our opinion, is further reason for a conservative and selective attitude toward utility stocks at the present time."

To split or not to split stock is a question often perplexing to management. For what it may be worth the New York Stock Exchange recently has completed a study showing the price ranges most attractive to individual investors. Based on two full trading days—March 18 and 25—the study shows that fully 45.5% of all stock purchased on those days was in the $10 to $25 class; 16.8% constituted purchases in the $10 to $14.99 range, 16% was in the $15 to $19.99 class and 12.7% in the $20 to $24.99 range.

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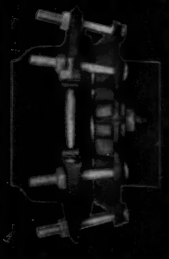

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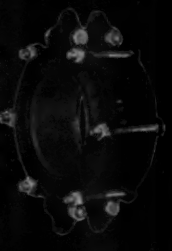

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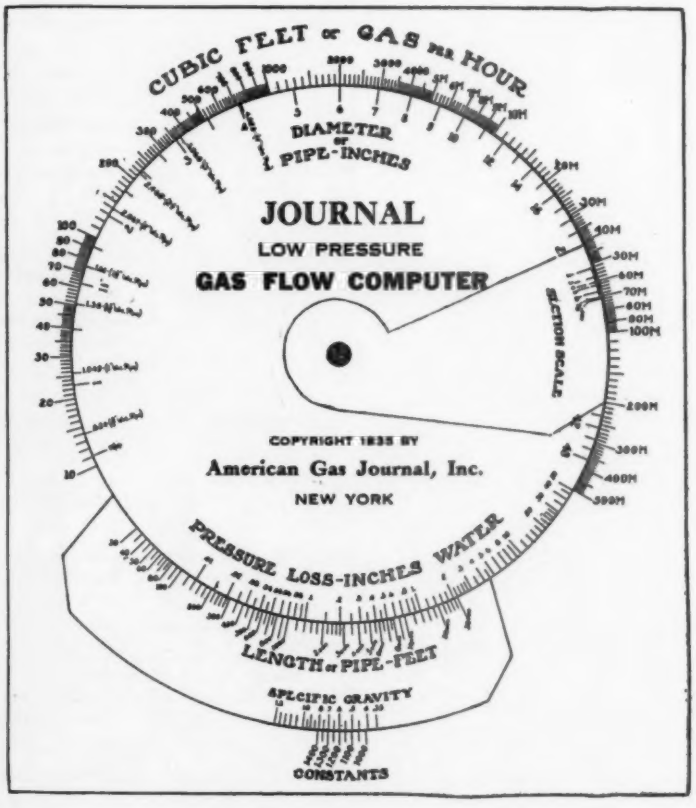

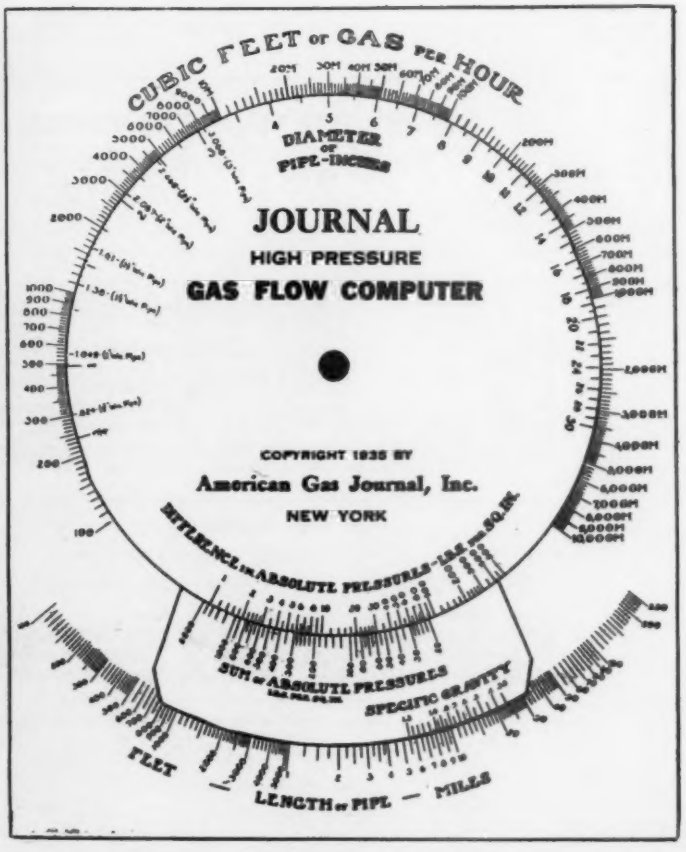

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GAS INDUSTRY CALENDAR

August

21 AGA Board of Directors, Headquarters.
24-26 Appalachian gas measurement short course, West Virginia University, Morgantown, W. Va.

September

9-11 PCGA, San Francisco.
9-11 30th Mid-West Gas School and Conference, Iowa State College, Ames, Iowa.
11 New Jersey Gas Association, Spring Lake, N. J.
26 Southern Gas Association, transmission section, round table on rights-of-way problems, Tutwiler Hotel, Birmingham.

October

6-7 Texas Mid-Continent Oil & Gas Association, Rice Hotel, Houston.
7-9 National Association of Corrosion Engineers, South Central region, Mayo Hotel, Tulsa.
19-23 National metal exposition, Public Auditorium, Cleveland.
26 AGA Board of Directors, St. Louis.
26-28 AGA annual convention, Kiel Auditorium, St. Louis.

November

9-13 National Hotel Exposition, Kingsbridge Armory, New York.
11-13 Wisconsin Utilities Association, Hotel Schroeder, Milwaukee, Wis.
17-20 AGA operating section, organization meetings, Hotel New Yorker, New York.
29-December 4 The American Society of Mechanical Engineers, Statler Hotel, New York.
30-December 2 Southern Gas Association, advisory council and management conference, Grand Hotel, Point Clear, Ala.

March, 1954

4-5 AGA transmission and storage conference, Jung Hotel, New Orleans.
15-17 Mid-West Gas Association, Fort Des Moines Hotel, Des Moines, Iowa.
25-26 Oklahoma Utilities Association annual convention, Biltmore Hotel, Oklahoma City.
25-26 New England Gas Association, Hotel Statler, Boston.

April, 1954

5-7 Southern Gas Association (Location to be announced)
12-14 AGA Sales Conference on Industrial and Commercial Gas (Location to be announced)
13-15 Southwestern gas measurement short course, University of Oklahoma, Norman, Okla.
20-23 AGA Distribution, Motor Vehicles and Corrosion Conference, Mount Royal Hotel, Montreal, Canada.
26-28 Mid-West Regional Sales Conference, Edgewater Beach Hotel, Chicago.
26-28 The 1954 annual convention, Southern Gas Association, Houston.

May, 1954

9 (week) 35th Annual National Restaurant Convention and Exposition, Navy Pier, Chicago.
9 (week) AGA commercial gas school, Chicago.
10-13 LPGA Annual Convention, Conrad Hilton Hotel, Chicago.
19-21 GAMA annual meeting, The Drake, Chicago.
24-26 AGA Production and Chemical Conference, Wm. Penn Hotel, Pittsburgh.
27-28 Natural Gas and Petroleum Association of Canada, Prince Edward Hotel, Windsor, Ontario, Canada.

June, 1954

20-24 Canadian Gas Association, Banff Springs Hotel, Banff, Alberta, Canada.
28-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

July, 1954

19-23 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

September, 1954

8-10 Pacific Coast Gas Association, Victoria, British Columbia.
28-29 Texas Mid-Continent Oil and Gas Association, Baker Hotel, Dallas.

October, 1954

11-14 AGA annual convention, Atlantic City, N. J.

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